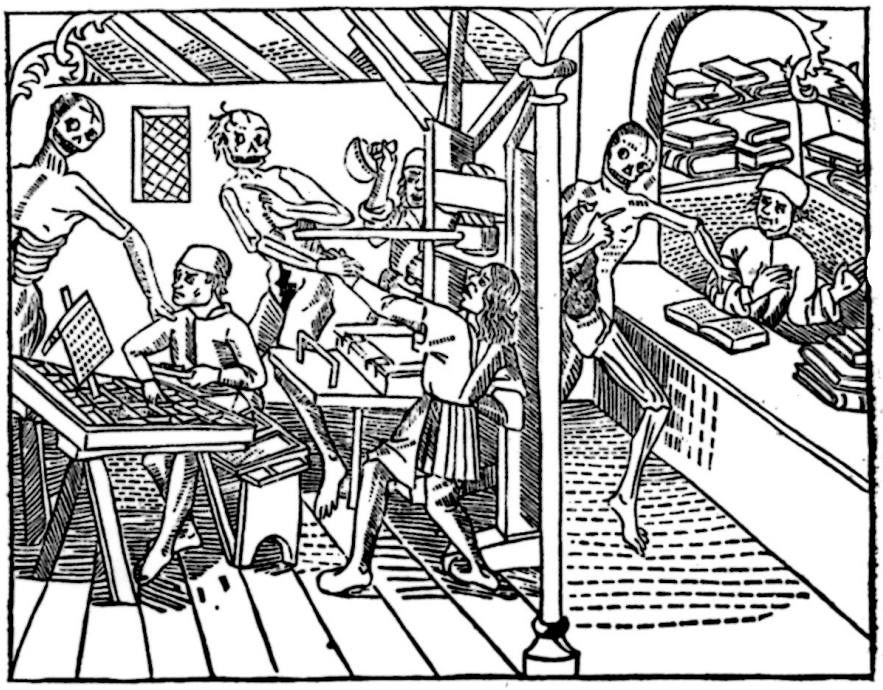
1. Dürer's drawing (now in the Musée Bonnat, Bayonne), dated 1511.

Albrecht Dürer's drawing of a printing press: a reconsideration

Alan May

This article argues that Dürer's drawing of a printer and printing press of 1511 (Fig. 1 centre section) should be examined more seriously than has been the case hitherto, and may show an early one-pull press that has been converted to two-pull. Because there are a number of ambiguities within the drawing some speculation has been inevitable but, wherever possible, I have based my arguments on a careful study of the drawing's details and on my experience of the practicalities of printing on hand-presses and of building a number of replica wooden presses, including one based closely on this drawing.[1]

The drawing reproduced in Figure 1 is explicitly dated 1511, making it one of the earliest representations of a press we have.[2] Only the woodcuts of 1499 or 1500 (Fig. 2)[3] and of around 1507



2. Death visits a printing office and bookshop (reduced from 132 × 174 mm).

1. Some of these same experiences informed my earlier 'The one-pull press', *Journal of the Printing Historical Society*, New Series 11 (2008), 65–89; my reconstruction of Dürer's press post-dates this article, however, and I have drawn further conclusions, partly as a result of that work.

2. The drawing is now in the Musée Bonnat, Bayonne (inventory number NI 1288).

3. From *La gra[n]t danse macabre des ho[m]mes*. Lyon: [Mathias Huss], 18 Fevrier 1499 [i.e. 1500?]. ISTC id00020500.

3. Woodcut printer's device of Jodocus Badius (actual size).

(Fig. 3)[4] are earlier. Despite being early and detailed, Dürer's drawing has not received the same attention as the other two, in part perhaps because it came late to the attention of printing historians. It was not referred to in Falconer Madan's study of early images of printing presses.[5] Madan did comment upon it later, in 1924,[6] but a detailed description had to await Ray Nash's *Dürer's 1511 drawing of a press and printer*.[7]

Another reason for this comparative neglect is that the drawing contains a number of features which at first sight appear implausible. These include a press framework apparently too short to support the bed when drawn back clear of the platen, and feet projecting forwards from the cheeks, an arrangement not found in any other early depiction of a press. The rectangular platen seems to be mounted wrongly; it has its short side towards the operator. There is also apparently no means of preventing the platen revolving when the press bar is pulled. The context of the drawing is not helpful either: its juxtaposition of a blacksmith, printer and baker (Fig. 1) is only understandable after we learn that Dürer's intention was jocular (see below). The drawing is also unfinished (as indicated in the text below the image) and shows the thread on the press spindle, and indeed most of the other smaller threads, the wrong way round. I hope later, by focusing the reader's attention on some details within the drawing, to provide explanations for most of these unusual features, but before

4. An early (the first?) printer's device of the Paris printer Jodocus Badius 'Ascensius' (1462–1535). Its earliest traced appearance is in a book dated 1507. See Falconer Madan, 'Early representations of the printing press', *Biblio-graphica* 1 (1895), 224–248; 'Addenda' 1 (1895), 499–502, and 3 (1897), 474–475. See also Madan's 'An early representation of the printing press' in *Transactions of the Bibliographical Society* IV (1896–1898), 239–240, which describes a woodcut device of 1515 copied from that of Badius.

5. Madan (1895, see note 4).

6. Falconer Madan, 'Early representations of printing presses (1499–1600)' in *The Bodleian quarterly record* IV:42 (1924), [165]–167.

7. Ray Nash, *Dürer's 1511 drawing of a press and printer*. Cambridge, Mass.: Harvard College Library, 1947.

doing so I should say something about Ray Nash's account of Dürer's drawing because it is one of the few that recognises its value.

Nash is very appreciative of the drawing's level of detail and considers it to be the clearest picture of a press that has come down to us from the sixteenth century and equal in importance to those depicted above (Figs. 2 and 3). His account consists of a collotype reproduction of the original drawing, together with a wide-ranging commentary. This draws attention to Dürer's likely knowledge of printing through his godfather Anton Koberger (*ca* 1440–1513) and his master Michael Wolgemut (1434–1519). Nash then refers to Erwin Panofsky's account of this drawing. Panofsky describes it as a 'Satirical Allegory on the Profession of a City Clerk'. [8] Apparently the addressee was Dürer's friend Lazarus Spengler (1479–1534), City Clerk of Nuremberg, with whom he lived in a state of 'jocular warfare'.[9] This is followed by a short and rather uncritical account of the press's physical attributes. Nash is less than reliable in his description here, probably because of unfamiliarity with the terminology. For instance, he refers to this press having a winter and a cradle. The winter is not visible in Dürer's drawing and the term 'cradle' when applied to a printing press is not a familiar one (I suspect that Nash is referring to what is normally termed the 'carriage'; this press does not have a conventional carriage, but a plank which slides on the press's framework). Nash notices the wrongly-drawn thread but does not mention any of the other anomalies and suggests that the bar is made of iron 'tapered and curved much in the manner of Moxon's late seventeenth century diagram'. The bar looks remarkably straight to me (though it could be curved or angled in a horizontal plane); Madan found no illustrations of presses with bent bars before the mid-sixteenth century.[10]

THE DRAWING EXPLAINED

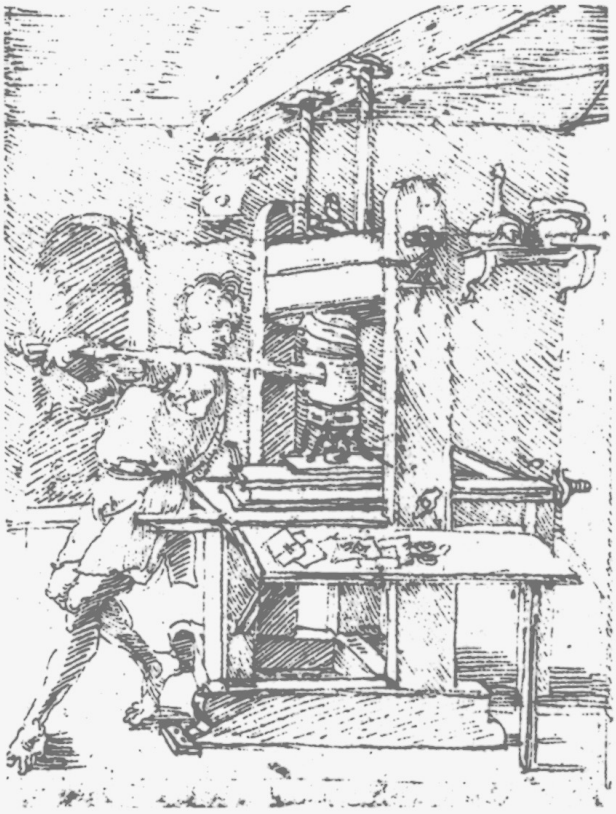
In my article on 'The one-pull press',[11] I drew attention to Dürer's deliberate distortion of the perspective in his drawing of this press. He commenced the drawing by imagining its nearest side almost parallel with the picture plane but realised part way through that this view-point would cause the spindle (visually its most important part) to be almost completely obscured. To avoid this, he completed the drawing with his view-point moved to the left, so that the spindle could be clearly seen. The evidence for this change of viewpoint can be found by examining that part of the drawing which is below the bed of the press.

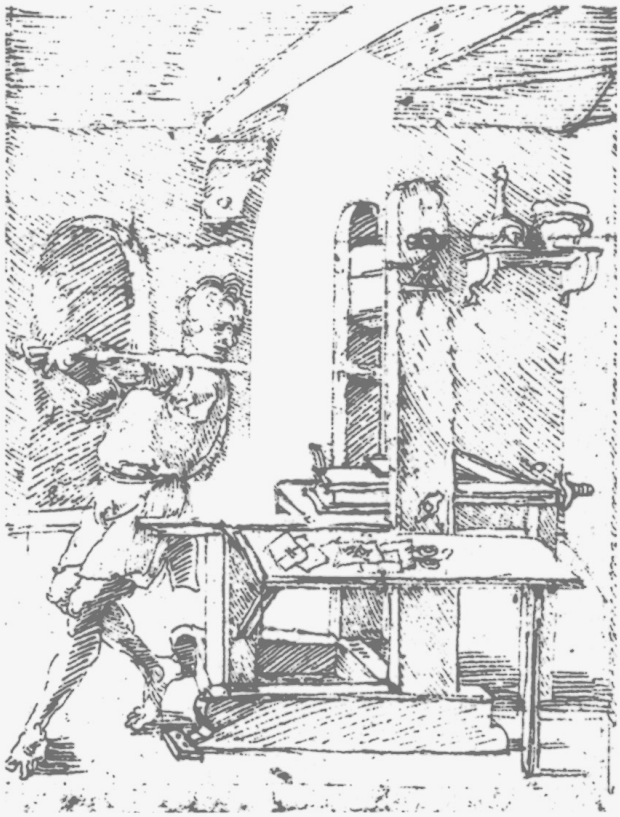
8. See Erwin Panofsky, *Albrecht Dürer*. Princeton: Princeton University Press, 1943, vol. II, p. 98 (no. 945). The caption at the head of the drawing reads 'Eytell missyff ... gschmit truckt und packn jm 1511 jor' ('Idle letter ... forged, printed and baked in the year 1511').

9. Spengler was Clerk at Nuremberg between 1507 and his death in 1534; he was a prominent supporter of Luther, and was among those excommunicated by Leo X in 1521.

10. Madan (1895, see note 4). Madan 13 (pp. 233–234) is an English wood-cut device which he dates to around 1548, and is the first he records to show a bar which is clearly curved. In his addenda of the same year (pp. 501–502) he describes and reproduces a Zurich woodcut of 1548, which also appears to show a curved bar and was the model for Jost Amman's famous depiction of the press in Hans Sachs' *Eygentliche Beschreibung aller Stände auff Erden* (Franckfurt am Mayn: bey Georg Raben, in verlegung Sigmund Feyerabents, 1568); in Amman's illustration, however, the bar is quite straight (see Fig. 2 on p. 84).

11. May (2008, see note 1), 70.





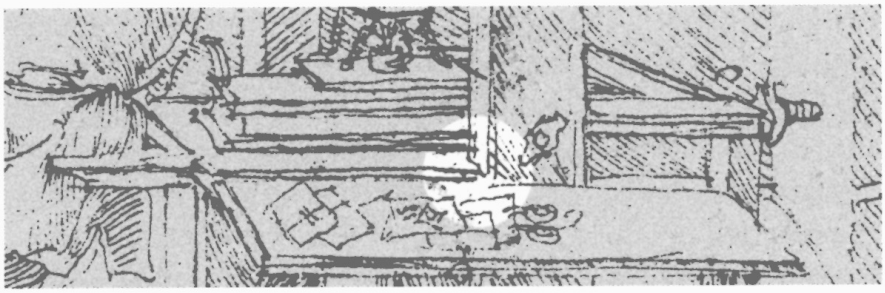
4a and 4b. 4a is a cropped but otherwise unmodified version of Dürer's drawing. 4b has the perspective 'corrected'. The rear cheek, plank, coffin, tympan and platen have been moved to the right to be consistent with Dürer's first view-point. The re-drawn portion of the rear cheek seen beneath the bed in 4a has been deleted in 4b.

It appears that Dürer first completed the nearside framework and started to draw the base of the cheek furthest from him, but then altered his perspective, drawing a second base for the far cheek, and the structure above, from the new view-point. When I first noticed this it seemed merely a curiosity, something Dürer had done to make sure that the spindle was in view so that the intended recipient (Spengler) would understand that he was looking at a printing press. Since then I have come to believe that it has an additional significance. Indeed, it is the key to the explanation for two of this drawing's other anomalies.

The change of view-point not only gave the drawing a rather twisted appearance, it also made it necessary to stretch everything in the region of the plank in order to amalgamate the two view-points. In Fig. 4b I have attempted to modify Dürer's drawing so that the rear cheek, the platen and everything below it on the press's bed have been returned to positions consistent with the original view-point. No re-drawing has taken place (although some parts of the original had to be deleted to avoid overlaps); I have simply moved the upper part of the rear cheek together with the bed to the right, so that it aligns with the base of the rear cheek as Dürer initially drew it.

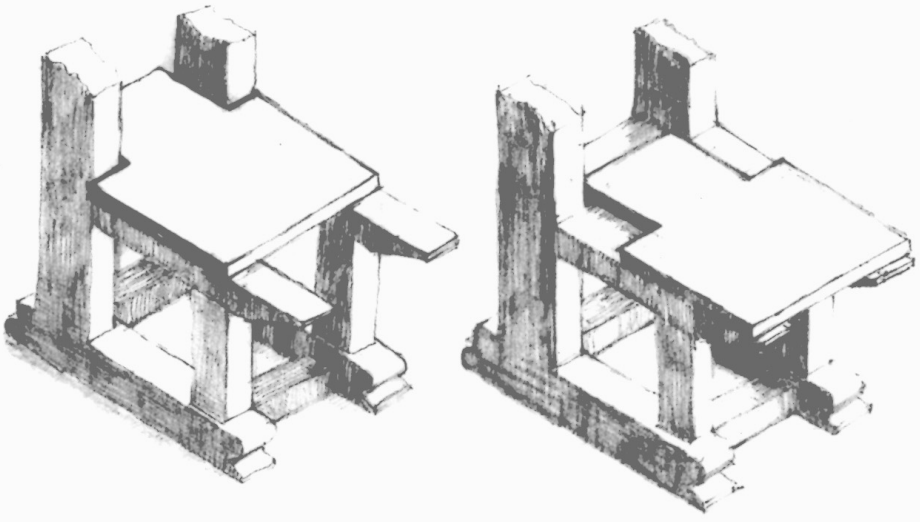
This 'correction' of the perspective removes two of the press's ambiguities at a stroke. The platen no longer looks to be mounted

wrongly, and the movement of the plank to the right has uncovered sufficient room on the framework to support the plank and coffin when they are pulled out from under the platen. Moving the plank in this way has also provided clues about how the press worked. Unlike later common presses, this press appears to have no carriage. The plank, carrying with it the coffin and tympan, simply slides on the press framework. If one looks at the right hand edge of the plank at the point in the drawing where it touches the nearside cheek (see the enlarged detail in Fig. 5) it is just possible to see that the plank appears to be too wide to pass inside the cheek and so could not be pushed in any further.



5. Detail, appearing to show that the plank is too wide to pass inside the cheeks.

The diagrams below (Fig. 6) are my attempt to show how I think the plank and framework must have worked. Note that I have drawn, and reconstructed, this press with two fore-legs, though it remains unclear whether the press shown by Dürer has two or a single broad fore-leg attached to the cross-bar between the feet. In the left-hand diagram, the plank is pushed in as far as it can go and is equivalent to the position depicted in Dürer's drawing. The right-hand diagram shows the plank pulled back, in position for the removal of the printed sheet, the application of an unprinted sheet, the inking of the forme etc.



6. The two positions for the plank (left fully pushed-in, in position for the impression, right pulled out, for the removal and application of sheets, inking the forme etc.)

Such limited movement suggests that this press was designed to be capable of one pull only. This is reinforced by the arrangement of its feet, which come forward from the cheeks – a design which is appropriate to a one-pull press but not to a two-pull press, which needs feet behind the cheeks in order to provide support to the hind-rails. However, by the time Dürer drew this press it had been fitted with hind-rails albeit of an unusual design. This implies that by 1511 it was capable of a second pull (hind-rails would be redundant on a one-pull press as the bed does not need to be supported behind the cheeks).

An examination of the earliest European printed books, dated between around 1455 and 1475, shows that they were printed on one-pull presses.[12] This would have meant that in order to print a folio bifolium, each of the four pages of type had separately to be positioned on the bed and printed off in the quantity required, then cleaned and removed. The second of each facing pair of pages would have to have been positioned on the press differently from the first, the opposite way round, to allow for the fact that the paper must be presented in a different orientation, rotated through 180 degrees. Printing just one folio sheet in black thus involved four separate printing cycles, and if a red printing was planned this would normally have increased to eight. Such a system had its drawbacks. It was slow and made errors of imposition and casting-off all too easy. A mistake at any one visit to the press could spoil an entire sheet (or, at best, half of that sheet). From the beginning printers must have realised that if both pages of the facing pair could be printed together, on a somewhat enlarged press, it would greatly speed-up and simplify the process. Unfortunately this was found not to be possible, as the pressure required to print two folio pages in one pull was more than a wooden press with a simple screw-mechanism could deliver. This remained the case, in spite of various improvements in press design, until the very end of the eighteenth century when rigid cast-iron presses were manufactured for the first time, operated by a system of levers which could deliver considerably more pressure.

During the1470s an alternative strategy emerged.[13] The bed of the press seems to have been modified so that the type for two pages could be mounted on it and the means of sliding it in and out extended so that it could project out behind the press. In order to do this, some additional support for the bed would have been needed in the form of hind-rails. This arrangement meant that the first page of any facing-pair could be printed as before but then, instead of having to pull back the bed and remove the printed

12. European books of this period were mostly printed in folio format, though quarto and occasionally octavo formats were also used. One-pull presses were generally replaced with two-pull during the 1470s and are rarely evident in books printed after 1480. See Lotte Hellinga, 'Press and text in the first decades of printing', *Texts in transit: manuscript to proof and print in the fifteenth century. Library of the written word 38; The handpress world 29*. Leiden: Brill, 2014, pp. [8]–36 (a revised version of an essay published in *Libri, tipografi, biblioteche* (edited by Arnaldo Ganda, Elisa Grignani and Alberto Petrucciani). 2 volumes. Florence: Olschki, 1997, vol. I, pp. 1–23).

13. Hellinga (2014, see note 11). See also Lotte Hellinga and J. B. Trapp, editors, *The Cambridge history of the book in Britain*, volume III, 1400–1557 (Cambridge: Cambridge University Press, 1999), pp. 79–80.

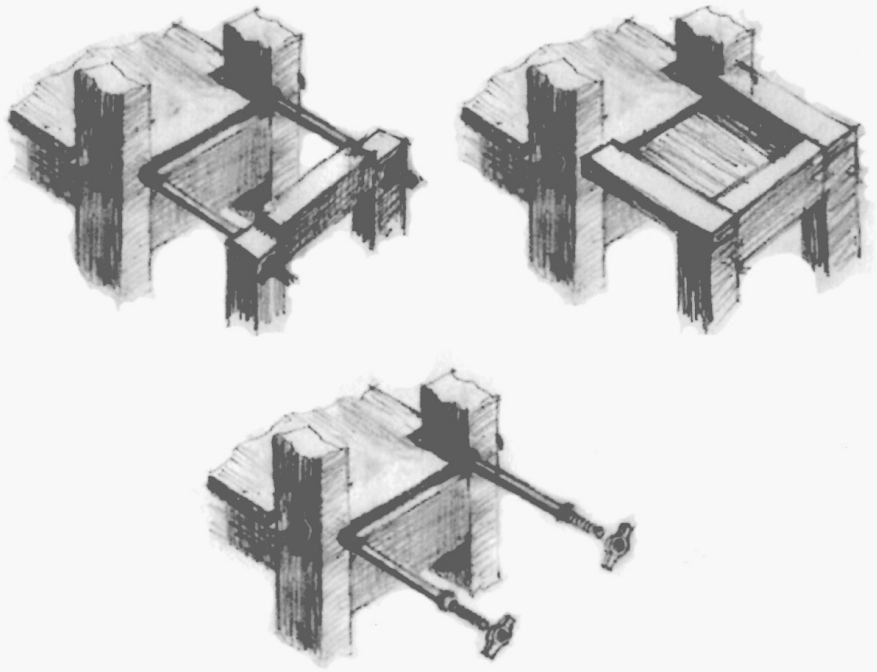
sheet, the bed could be pushed in further so that the second page was under the platen and could be printed by means of a second pull on the bar. It is probable that a means of winding the bed in and out (the simple windlass system seen in later presses) was added to the mechanism at this time, as printers needed to move a heavier bed and to start and stop it accurately at two points in the printing cycle. This arrangement must have been a great improvement. Printers could now print one side of a sheet at each visit to the press, without overstressing the mechanism. This modified press, referred to as a 'two-pull press', remained the standard model until the introduction of iron presses around 1800. The earlier press (of which no example, account or clear visual representation survives) is termed the 'one-pull press'.

Changing from one to two pulls brought early printers important savings in time and make-ready, simplifying registration, sheet-handling and drying. Once the advantages of the two-pull arrangement were known, press-builders are unlikely to have continued building one-pull presses, as the materials and work involved would not be very different. It is likely that there would initially have been a demand to fit hind-rails to existing one-pull presses. And Dürer's drawing shows, I believe, just such a press, as the method used to achieve the second pull gives every appearance of being an improvisation.

THE ADDITION OF HIND-RAILS

It appears from Dürer's drawing that the hind-rails were attached to the press using threaded metal bars and wing-nuts. This unusual construction (I know of no other printing press image which shows anything similar) caused me initially to wonder whether this press had been specifically designed for ease of assembly and portability. With this in mind I decided to make a model of the press depicted in Dürer's drawing. Since making it, I have concluded that portability and easy-assembly were not intended, as conventional wood-joints far exceed the number of wing-nuts. Six of the wing-nuts are visible in the drawing and others, though not visible, can be inferred. Apart from the large single nut in the centre of the cap which is there to provide a means of adjusting the height of the piston, all the others are paired and most have an obvious function. The exception is the pair, one of which can be seen on the front cheek just above the table. I assumed initially that this one together with its unseen partner on the other side of the press were there simply as a means of clamping the cheeks to the winter (a substantial block of wood fitted between the cheeks, below the press

bed, placed there to resist the downward pressure of the platen; it is not visible in the original drawing but must have been present). However, when this was tried on the model it became obvious that it would not work. The wing-nut is positioned in the drawing above the plank, so cannot be attached to the winter which is below it. I next assumed that the wing-nut had been drawn too high up the cheek, so I drilled a hole for the thread a little lower; but this did not work either as the side-table attached to the press's right hand side was in the place where the nut needed to be. Only then did I realise that the bars for attaching the hind-rails might have right-angled bends in them, with threads and wing-nuts on each end. This arrangement seems entirely feasible to me, and provides a simple and robust means of attaching the hind-rails to the press. The pictures below show the sequence of construction (see Fig. 7). The bars are fixed first to the cheeks, then to the hind-rails. Finally a wooden tray with its sides resting on the bars is dropped into place. The base of this tray acts as an extension of the plank, providing support for the bed during the second pull.

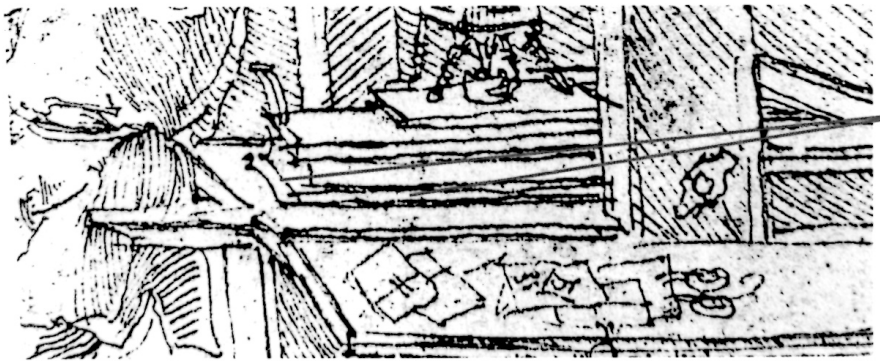


7. Probable method of attaching hind-rails to the press.

MANAGING THE SECOND PULL

With the plank unable to move further in after the first pull, because it was blocked by the cheeks, the solution seems to have been that the coffin together with its tympan was made to slide on the top surface of the plank for the second pull. As the coffin needed to slide forwards only and had to be prevented from moving

sideways or backwards, the plank must have been fitted with some means of constraining the coffin's movement. On the Dürer press-drawing there appear to be battens surrounding the coffin which could perform this function (see Fig. 8).



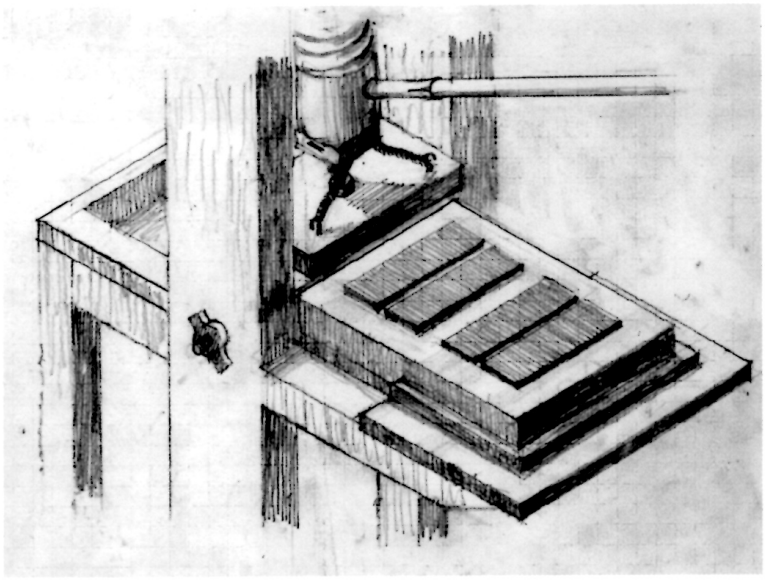
8. Battens surrounding the coffin.

If this explanation is correct then the printing sequence will have been as follows. Figures 9, 10 and 11 illustrate the stages. For clarity the tympan has been omitted.

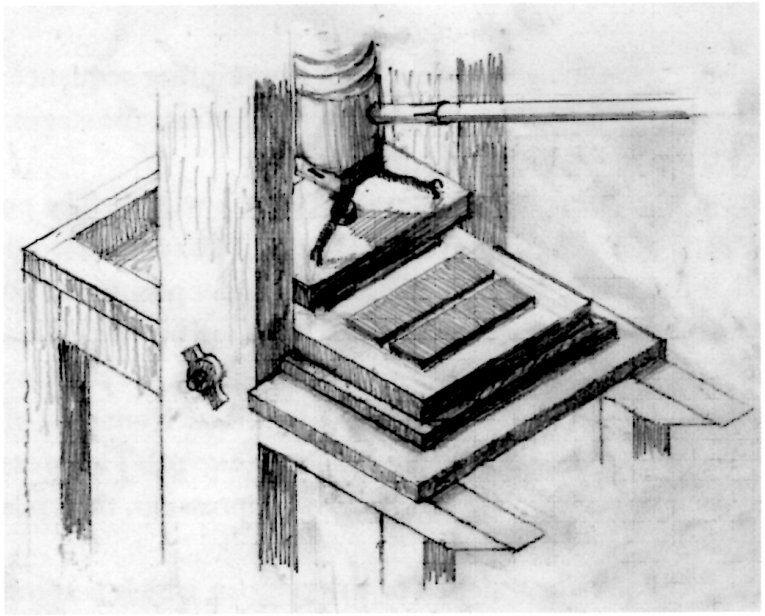
At the start, the plank, coffin and tympan would all be pulled back so as to be clear of the platen (Fig. 9). The tympan would be raised, the printing surface inked and the paper positioned over it (on the nature of the tympan and frisket see below). With the coffin still in its pulled-back position on the plank, the plank would have been pushed in as far as it would go. The front part of the forme would then be in first-pull position (Fig. 10). The press bar could then be pulled round to take the impression, then pushed back to its original position.

Using the handle attached to the tympan which is shown in Dürer's drawing but not in my figures 9–11, the coffin and tympan would then have been pushed forward into the second-pull position (Fig. 11) by sliding them over the top surface of the plank. The press would then have been operated again to take the second impression. The bar would then be pushed back to its start position (on a press with a wooden thread the bar would not spring back, as it would on later common presses with metal spindle-threads). Finally everything would have been returned to the start position by pulling back on the handle attached to the tympan. This would first bring the coffin back against the front batten and would then bring the plank back until the tympan was clear of the platen in order that the printed sheet could be removed (as in Fig. 9). Note that as the arrangements for the first and second pulls are mechanically separate, a windlass for winding the bed in and out would have been superfluous.

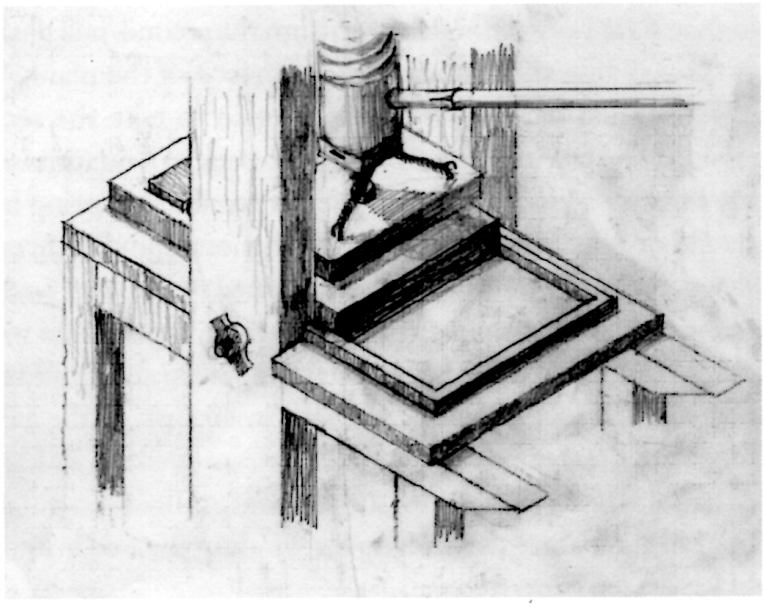
9. The plank is pulled back clear of the platen to enable the inking of two folio pages of type. For clarity the tympan has been omitted.



10. The plank has been pushed in so that first page of type is under the platen. This is the point in the printing cycle illustrated by Dürer. His tympan prevents us from seeing whether a second folio page was contemplated, but note that the plank cannot be pushed in further because it is blocked by the cheeks. Some other means of advancing the coffin must have existed for a second pull to be possible (as in Fig. 11).



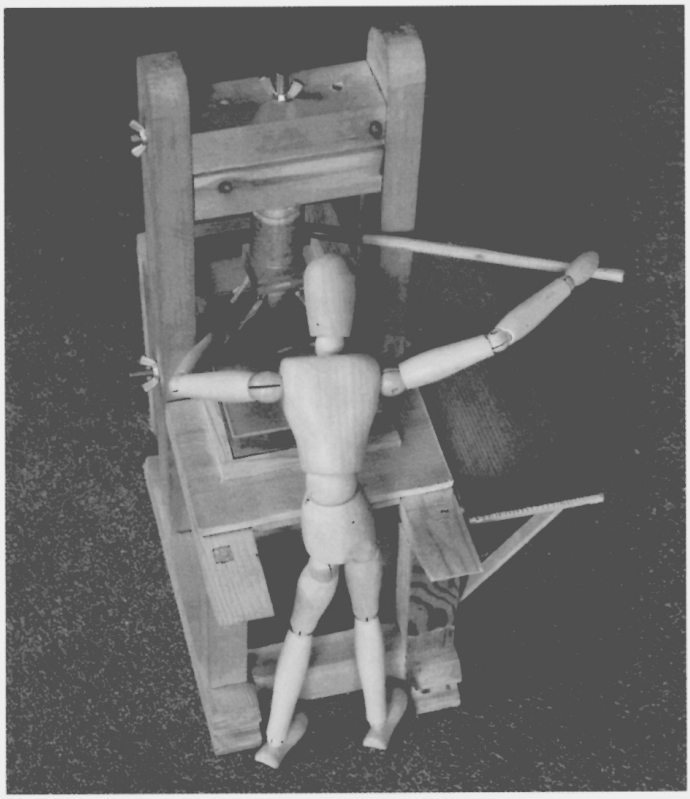
11. My conjectured solution for managing the printing of a second folio page. The coffin is allowed to slide on the top surface of the plank, enabling the second page to be positioned under the platen. The first page is now projecting behind the press and is supported by the hind-rails. The coffin is kept on course by the battens nailed to the plank's surface and by the cheeks and hind-rails.



THE ABSENCE OF A TILL

The till on a wooden press is typically a plank about 50 mm thick mounted horizontally between the cheeks about half way between the nut and the platen. Its purpose is to prevent the platen rotating when the spindle's screw is rotated. It usually works in combination with a 'hose', in early presses a square-sectioned collar fitted around the spindle and from which the platen is suspended. The till has a square hole through its centre through which the hose passes. The two are a sliding fit.

In my article on 'The one-pull press'[14] I stated that 'The absence of the till must be because Dürer simply hadn't got round to drawing it in … a hose without a till is a nonsense: neither has a function without the other'. While writing the present paper, I thought again about this. Dürer's press has some features, notably an extremely short hose fitted close up against the spindle-boss which caused me to wonder whether it might have been operated without a till.



12. The stance of the pressman when about to take a pull. The left hand steadies the platen while the right starts the pull.

The photograph (Fig. 12) of my model of Dürer's press with a 'lay figure' operating it shows how I think a press without a till could have been managed. We are at the point in the printing cycle where the pressman is about to make a pull. At this stage he could have taken the bar in his right hand while grasping the

14. May (2008, see note 1), p. 71.

platen-cords with his left. He could then begin the pull at the same time using his left hand to control the platen so that it stayed in approximate alignment with the tympan sides. Once the platen had made contact with the tympan it would no longer move and the pressman could release his left hand and complete the pull. While this procedure would not have been as convenient as using a press with a till, there is little reason to assume that it would substantially slow down production, and trials using the one-pull press described in my article[15] with its till removed have shown that this method is perfectly feasible. Note also that the plank on the model is very short, as it is in the 'corrected' version of Dürer's drawing (Fig. 4b). This short plank makes it possible for the pressman to stand close in, and reach both the platen-cords and the press bar at the same time and so control the platen's descent.

However, soon after first preparing this account I was commissioned to build a full- sized version of the press depicted by Dürer. This was completed in August 2014 without a till. As an experiment I then made a till which could be clamped on, without having to modify the press framework. The improvement in the press's performance was very noticeable, particularly in the much-steadier descent of the platen. I have concluded therefore that my first thought on this matter, that the till's absence from the drawing was because Dürer had simply not included it, is probably the correct one. A photograph of the full-size reconstruction with the till fitted appears below (Fig. 13).[16]

THE TYMPAN IN THE DÜRER PRESS DRAWING

Dürer's drawing shows a tympan but does not make clear how it was mounted. There is no indication of a hinge on the front edge of the coffin, and no gallows on the bed to support the tympan when lifted from the forme. The tympan could have been hinged on the rear of the coffin. This arrangement is one of the two alternatives used in my reconstruction. The other is simply to leave the tympan unattached but capable of being positioned accurately using the outer edges of the coffin's corner-clamps. There is no indication in the drawing of the presence of a frisket, although it is likely that one was used. In my reconstruction the frisket is not attached to the press but instead locates on the inner edges of the coffin's corner-clamps.

IS THIS A FIFTEENTH-CENTURY PRESS?

Dürer's drawing was made a few years after the woodcuts depicted in Figures 2 and 3, and so has come to be regarded as not

15. May (2008, see note 1), p. 70.

16. This press was commissioned by a group of printing historians, and is currently (2015) on loan to the St Bride Library, where it may be seen and used in the printing workshop.

particularly early. However, if we compare the technical features of these three presses there is to my mind little doubt that Dürer's drawing shows the earliest press. The *Gra[n]t danse macabre* and Badius images both show presses with hinged tympans, hoses and tills, and feet that point backwards. They are both two-pull presses. The Badius press has double head-bolts and a spindle that looks too thin to be made of wood. It looks remarkably similar to common presses still in existence today, all of which have metal spindles.

It is quite probable that at this early period the mechanism of the printing press was improved in a number of ways. Nevertheless, the change from one- to two-pull presses in the 1470s must have been a significant milestone. The fact that the Dürer drawing shows so many features which were obsolete by 1500 argues for a fifteenth-century date. Dürer appears to have known this press well, in spite of drawing its thread incorrectly; it was probably drawn from memory, but the amount of detail shown, including visually insignificant details like the platen-pan and the tiny wooden floor-stop, strongly suggests that this was a familiar object. His woodcuts must have needed proofing. Did he perhaps have access to one of Koberger's or Wolgemut's obsolete presses for this purpose?

CONCLUSION

The foregoing discussion may be summarised in the following crucial points, which I think have to be accepted if my arguments are to stand. These are:

1. Dürer changed his view-point part way through making the drawing, causing distortions in the region of the platen and bed.
2. The drawing of the plank at the point at which it touches the front cheek indicates that it is already as far into the press as it can go, so that the conventional way of taking the second pull by pushing the plank further in is not possible.
3. This implies that as originally conceived this press was designed to make just one impression at each visit.
4. The press has hind-rails but these are bolted on rather than jointed into the press-framework and are probably a later addition.
5. My explanation for the method of achieving the second pull is speculative and smacks of improvisation but this is to be expected if this press was made as a one-pull press and later adapted to two-pull. It has been found to work well in the reconstruction, both in the full-scale and smaller models.

ACKNOWLEDGEMENTS

This is in some ways a sequel to my 'One-pull press' article of 2008. At that time my friend and one-time colleague Margaret Smith provided me with the help and advice I needed to complete the project, so it seemed only natural to seek her assistance again. She has provided this unstintingly and I am most grateful. I wish also to express my thanks to 'The Duerer Group', which provided me with the funding to construct the full-sized reconstruction.

13. A full-sized reconstruction of Dürer's press fitted with hind-rails and till. Both are detachable. The forme has been moved into position for the first pull. This press is now on indefinite loan to the St Bride printing workshop.

GLOSSARY

The terms described here are common to most wooden presses, but my descriptions refer specifically to the press depicted in Dürer's drawing.

Bar The lever employed to rotate the spindle. On Dürer's press it appears to be of wood but with a metal reinforcement where it enters the spindle.

Bed I have used bed as a collective term for all the parts of the press that reciprocate horizontally during printing. On the Dürer press it evidently consists of the plank, the coffin, a flat surface (probably of stone) contained within the coffin, the forme, tympan and frisket.

Cap A substantial wooden beam fitted across the top of the press and jointed to its cheeks. The head of the press is suspended from it by means of head-bolts.

Carriage A framework mounted between the cheeks on a wooden press, fitted with a pair of metal rails on which the bed slides. It is not present in the Dürer drawing.

Cheeks Two large upright wooden posts. They form a major part of the press's framework and support the head and impression mechanism.

Coffin A strong wooden frame, normally fixed to the plank, into which the stone is fitted. In the Dürer press the coffin may not have been fixed in this way, as in order to manage two pulls it would need to be moveable.

Forme The printing surface, usually consisting of type-matter arranged within a frame or chase.

Frisket A frame, usually hinged either to the tympan or the coffin, covered with a parchment and/or paper membrane (see pp. 84–85). One or more 'windows', which correspond to the page(s) of type in the forme, are cut from its centre. The frisket's function is to protect the page margins and provide support for the sheet during printing.

Gallows A simple wooden frame fixed to the front of the plank. Its purpose is to support the tympan when folded back from the forme. No gallows is present on the Dürer drawing.

Head A large wooden beam fitted across the press below the cap. Tenons project from each of its ends. These are a sliding fit in vertical slots cut into the inner faces of the cheeks. Its height can be adjusted by means of head-bolts. In the centre of its under-surface is carved a female thread, to receive the spindle.

Head-bolts Usually fitted as a pair, these are used to raise or lower the head of the press in order to adjust the distance between the platen and tympan. Dürer's press has only one.

Hind-posts and rails A wooden framework fitted behind the cheeks. It is provided to support the weight of the bed during the second pull.

Hose In early presses, a square wooden block typically about 150 × 150 × 300 mm, with a hole bored through its centre large enough to allow it to encase the spindle. Near its top end is fitted a garter which allows the hose to rotate independently of the spindle. Its bottom four corners are provided with hooks enabling it to be attached to the platen. Such hoses are known as 'box hoses' (later presses often had hoses of a different construction). The hose's function is first to allow the platen to maintain its orientation when the spindle is rotated and second to steady the spindle as it descends. It achieves this by working in combination with the till. Dürer's drawing shows a very short and simple form of hose. Its garter consists of four wooden 'biscuits', each fitted into a slot on one of its four faces.

Plank A flat wooden board, the full width of the press, on which the coffin, stone, forme, tympan, frisket and gallows rest. It is normally mounted on a carriage so that it can be slid under the platen. In the Dürer drawing, no carriage is present; the plank simply slides on the press framework.

Platen A rectangular block fitted to the base of the spindle. Its purpose is to spread the load generated by the spindle-thread evenly over the area to be printed. Platens are frequently made from wood, sometimes with a lower face of metal. In the Dürer drawing the platen is very thin so is probably made entirely in metal.

Platen-cords Strong cords used to lash the hose to the platen. Cords are used rather than rigid fixings because the platen needs to be able to adjust slightly to the printing surface.

Platen-pan A metal cup containing lubricant mounted in the centre of the top surface of the platen. The point of the spindle locates into it.

Rounce The handle, spindle and drum of the windlass fitted to the carriage, provided so that the bed can be wound in and out. The drum of the rounce is attached to the plank with straps or girths. Nothing of this mechanism can be seen in the Dürer drawing, and the press depicted probably had no rounce or windlass.

Spindle A large wooden (later metal) cylinder with a male thread cut into its upper end, corresponding to the female thread in the head. Below the thread is a boss into which the bar is fitted. Below the boss the cylinder's diameter is reduced so that it may pass through the hose. A narrow groove is cut into this reduced section into which the 'biscuits' of the hose fit. The base of the spindle is pointed so as to fit into the platen-pan.

Stone A slab of stone (often marble) rendered flat and used to support the forme. It is contained within the coffin.

Till A plank fitted between the cheeks on a wooden press, about half way between the head and the platen. It has a square hole cut into its centre to accommodate the hose. It works in conjunction with the hose to prevent the platen revolving when the press is operated and to steady the downward movement of the impression mechanism. It is absent from the Dürer drawing.

Tympan A wooden frame, often hinged to the coffin, over which is stretched a parchment membrane. Tympans are usually in pairs with one fitting inside the other, with soft packing between. The main function of the tympan is to cushion the paper and forme from the platen and help to even out its pressure.

Winter A large balk of wood fitted between the cheeks just below the plank. It is not visible in the Dürer drawing because the table is in the way. Its purpose is to resist the pressure generated by the spindle during printing.