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PRODUCING SCENES IN RELIEF: THE BIRMINGHAM WAY

by Peter Hayward

At the Society's meeting in Spring 2008, Hannu Vuori showed a teapot (Fig. 1) whose body was decorated with a copy of the classical scene on the famous Portland Vase in the British Museum. This vase, in cameo-glass, is thought to date from 5-25AD and was probably made in Rome. It was brought to England by the British Ambassador at Naples, purchased from him by the dowager Duchess of Portland in 1784 and was eventually sold to the Museum in 1945 by the 7th Duke of Portland[1]. The vase's fame was greatly enhanced when Josiah Wedgwood made pottery copies in 1785-90.

This teapot is not the only surviving example. A second one was described and illustrated in the catalogue of the 1969 Reading Exhibition[2] and is shown in Fig. 2,

Fig. 1. Hannu Vuori's teapot.

Fig. 2. The second teapot, shown at the Reading exhibition. Photo: Michael Kashden.

whilst a third example is shown in Fig. 3. There is a fourth example in Harvard House[3]. All four have the same body, handle and lid, but the spout on Hannu Vuori's is different from the other three and all four knops differ. Further, the Reading and Harvard House

Fig. 3. The third teapot. Photo: Michael Kashden.

examples have no plinth, and whilst both the others have plinths, they are of different designs. The Reading catalogue dated the teapot to 1790-95 on the assumption that it was inspired by the success of Wedgwood's pottery vases. However, the spout, handle and plinth styles are all more consistent with the 1840s and 50s. Moreover, at least on Sheffield pewter, metal handles were not introduced until 1840[4].

Like the original Portland Vase, the scenes on the outer surfaces of these teapots are in relief but the inside surfaces are smooth. They have different marks under the base which do not directly identify the maker, but which include the description *PATENT SEAMLESS* (Fig. 4). A search through the patent indexes revealed only one possible candidate, English patent 11378 of 1846 by Richard Ford Sturges of Birmingham (PS9037). As was common at the time, the specification describes not one but three different inventions. The first has nothing to do with teapots or pewter – it is a tap incorporating a filter. The second is a method of casting teapots and other spouted vessels in metal moulds such that the body, spout, sockets for the handles and joints for the lid are made of one casting. Finally, the third invention is about casting insulated metal handles for teapots.

The expression 'seamless' is never used in the patent specification, but confirmation that this is the right patent comes from the Sturges' entries in Birmingham trade directories. An 1849 entry reads *Manufacturer of patent seamless tea and coffee sets, damask and plain britannia metal, british plate, electro and magneto plated and silver wares* whilst an 1852/3 directory has *Electro-plate and Britannia plate manufacturer, and maker of the patent seamless tea and coffee services*[5]. Further confirmation comes from the mould lines inside the bases of the teapots[6] (Fig. 5). These match exactly the segmented core described in the patent specification and shown in cross section in Fig. 6. (The missing mould line in Fig. 5 is presumably simply because those two parts of the core fitted together very snugly.)

So how were the teapots cast? Fig. 7 is a modified and simplified version of one of the patent drawings. It depicts the mould in cross section, with what will become the base of the teapot uppermost. The outer body of the mould (shown in black) consists of two halves held together by screw clamps. A stand (mid grey) supports the outer body and the six segments (light grey) that make up the inner core. Further cores, held in place by pins, create the bores for the spout and handle sockets. With the stand on a slowly-revolving table, the inverted funnel shown top left is placed on top of the mould and the metal poured in. The funnel deflects the metal to the space between the outer body and core, whilst the rotation makes it easier to fill the mould evenly. Once the metal has been poured, the funnel is removed and the block dropped forcibly into the position shown. This drives the metal into all parts of the mould and into any pattern engraved on the inner surface of the outer body, surplus metal being displaced upwards through the central hole in the block. In addition, the two halves of the outer body are screwed together even more tightly at this stage, to give greater sharpness to the pattern. Sturges also says that passing electric current through the metal whilst it is being poured produces even finer castings. He did this by connecting a battery between the ladle and the

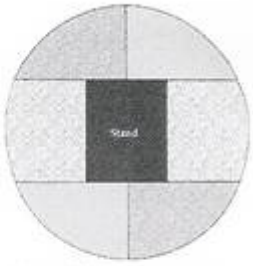

Fig. 6. The cross section of the teapot mould, from the patent specification.

Fig. 4. The marks. Top: The punched marks on the Vuori teapot. Middle: The domed shield on the third teapot. Bottom: Part of the dented domed shield on the Reading teapot. Photos: Hannu Vuori and Michael Kashden.

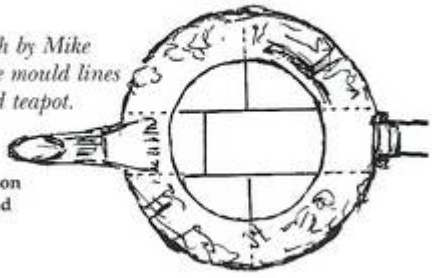

Fig. 5. A sketch by Mike Kashden of the mould lines inside the third teapot.

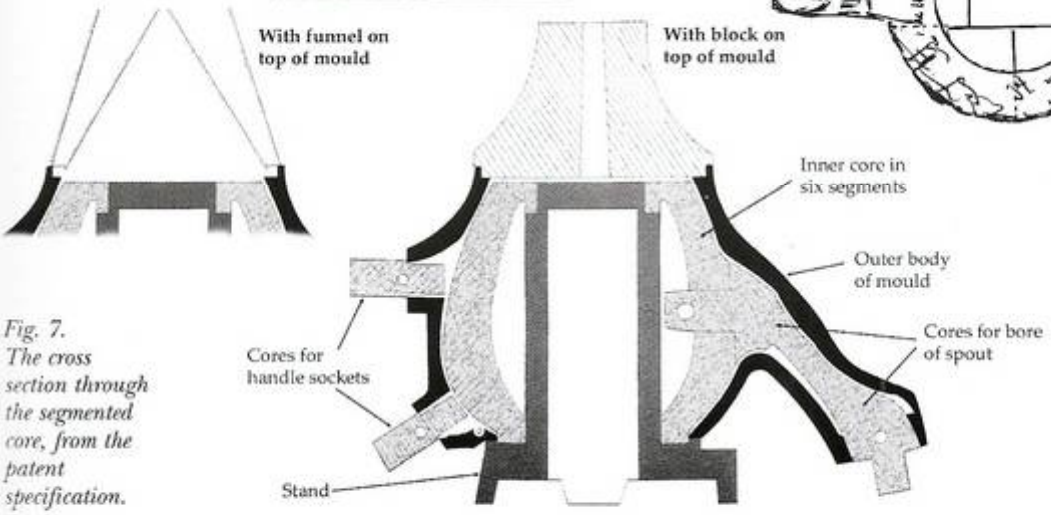

Fig. 7. The cross section through the segmented core, from the patent specification.

mould. Possibly the heating effect of the current slowed the solidification, giving more time for the metal to be forced into every crevice.

The only finishing the teapot needed was on the underside of the base, after cutting off the stub of surplus metal forced up the central hole in the block. The circular outline of where the stub had been can still be seen underneath the stamped marks on Hannu Vuori's teapot. On the other three teapots, though, even this single finishing step was avoided by soldering over the remains of the stub a domed shield bearing a cast image of the royal arms and the words *PATENT SEAMLESS*. The remains of the stub can be made out on the Reading and Harvard House teapots, which have a dented shield except at the point where the stub will not allow the shield to dent further. The domed shield was probably an improvement introduced part way through the period of production, which means the Vuori mark must be the earlier. The variations in the spouts suggest that Sturges modified the spout section of the mould at the same time. The plinths were presumably an optional feature, made separately and soldered on afterwards. To make the insulated handles, Sturges started with a wooden handle and used that as the core inside a handle mould (Fig. 8). This creates a pewter shell around the wooden handle, leaving the ends of the latter free for insertion into the sockets on the teapot after adding insulating rings, eg of ivory. This is a very simple and neat solution to the problem of providing a metal handle that doesn't get too hot.

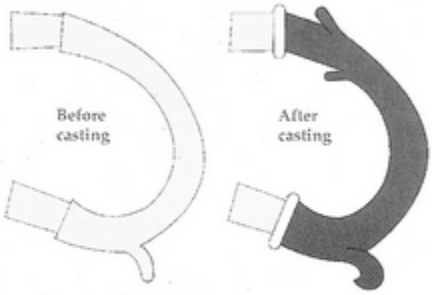

Fig. 8. Making the handle, from the patent specification.

In addition to the four teapots discussed above, David Hall has drawn my attention to a fifth example illustrated in the *Journal of the Cork Archaeological and Historical Society* for 1911 (Fig. 9). Save for the knop, it appears identical to the Reading and Harvard House examples. The Cork interest stems from the fact that it has the Cork arms engraved immediately above the spout and the letters RCCM (for Royal Cork County Militia) under the base. It is also said to have "underneath the foot and superimposed on it, a shield charged with a crowned harp in a circle". This appears to be describing a variant of the domed

Fig. 9. The Cork teapot.

shield, but with a crowned harp replacing the royal arms, and that would make sense if Sturges had also obtained an Irish patent for his invention. Whilst no Irish patent specifications of that period survive, there is an index of them, but I have not been able to check whether it includes a Sturge's patent.

Sturges is much better known as a Britannia ware Manufacturer, and indeed that is how he describes himself in the patent specification even though none of the three inventions is concerned with Britannia metal. It is therefore surprising to find that he was the patentee. The second invention enabled him to produce relief decoration which, as the photographs show, was of quite good quality whilst maintaining a smooth interior. He clearly used the invention for coffee pots too. However, he only seems to have exploited it for about 10 years. His entry in an 1858 directory makes no mention of patent seamless wares, even though the text of the entry is as long as the 1849 one, which suggests he had ceased production by then[7]. The fate of his insulated handle invention is less clear, because without removing handles from tea and coffee pots it is not possible to see whether they have a wooden core.

ACKNOWLEDGEMENTS

I am very grateful to Hannu Vuori and Michael Kashden for supplying details of the teapots and for spotting the features that helped confirm how they were made.

REFERENCES

1. For details and pictures of the Portland Vase, see the British Museum web site.
2. *Exhibition of British Pewterware through the Ages*, Reading Museum & Art Gallery 1969, item 195.
3. Catalogue no. SBT 1996-44/N860/470.
4. Jack L Scott, *Pewter Wares from Sheffield*, Antiquary Press 1980 p77.
5. *White's Directory 1849* p260 and *Slater's Directory 1852/3* p357.
6. The Harvard House example has not been checked for mould lines, but they are present in the other three.
7. Dix's Directory 1858 p286.

PRODUCING SCENES IN RELIEF: THE SHEFFIELD WAY

by Peter Hayward

The half pint mug shown in Fig.1 is made of Britannia metal and has a vertical seam in line with the handle. The outer surface has a military scene in relief, shown expanded in Fig. 3. Carl Ricketts reports seeing a pint mug with exactly the same scene, though because the mug was bigger, the scene occupied a smaller proportion of the surface. The decoration cannot have been produced by stamping or embossing, though, because the inner surface is smooth. So how was it done?

The maker's mark underneath (Fig. 3) gives a clue. It reads:

"J CARPENDALE & CO
PATENTEES 17 MEADOW ST
SHEFFIELD"

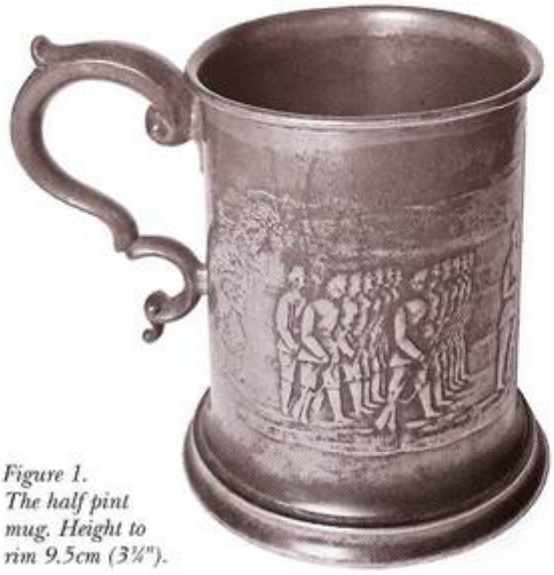

Figure 1. The half pint mug. Height to rim 9.5cm (3¾").

Figure 2. An expanded view of the scene on the mugs.

Figure 3. The maker's mark on the half pint mug.

The British patent records show three John Carpendale patent specifications. The first was specification 2239 of 1861, filed on 7 September. It is in the joint names of John Carpendale, Britannia Metal Smith (PS14960) and Thomas Middleton, Table Blade Grinder (PS14962), both of Sheffield. The title reads *Improvements in means of producing raised chasing on copper, silver and Britannia metal by the application of pressure.* It was accompanied by what was known as a Provisional Specification, which describes the invention but doesn't give full details of how it is to be carried out. A Provisional Specification gave a six-month window in which you could publicise and work the invention without jeopardising your right to apply for a full patent.

Exactly six months later, on 7th March 1862, Carpendale and Middleton lodged an identical Provisional Specification, 611 of 1862. This was effectively re-starting the patenting process from scratch, which they could only do if they had not publicised or used their invention in the intervening period. It gave them a fresh six months' grace. On 25 October 1862, just outside that period, the full patent application was finally made by John Carpendale alone, number 2872 of 1862. The title no longer mentioned copper and silver but simply referred to "Britannia and other compressible metals". It was accompanied by a 'Complete Specification' with full working drawings.

The drawings are large and complicated, so I have provided a simplified side view drawing in Fig.4. A wheel driven by a belt turns a shaft carrying a wooden bed plate. The bed plate supports a steel plate impressed with the design. The Britannia metal sheet

to be embossed, shown in black, is held against the steel plate by a non-rotating 'steadying plate'. A 'pressing tool' is then forced against the back of the Britannia metal through an aperture in the steadying plate by tightening the screw. Whilst the Britannia metal sheet is rotating, the pressing tool is drawn radially across the back by turning the handle, and its pressure forces the metal into the indentations on the steel plate. The end result is a round sheet with a relief pattern, which can be trimmed to a rectangle to make the drum of a mug. Even the pint mug only requires a sheet of about 26cm (10¼") diameter.

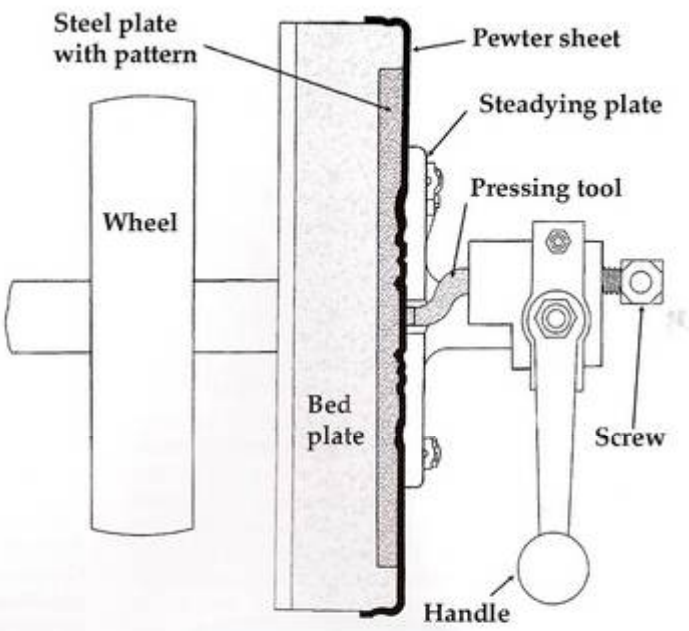

Figure 4. The machine described in the patent specification.

The patent drawing shows the back of the plate ending up with a contour that matches the front – just as you would get by stamping. However, the drawing is wrong because the machine shown cannot produce this effect. Once you have adjusted the screw, the head of the pressing tool remains at a fixed distance from the bed plate and so the back of the sheet must end up smooth. Indeed, the smooth insides of the mugs are clear evidence that this is what happens. The tool head must therefore squeeze the metal into the indentations on the steel plate, the same effect as you would get if you laid a sheet of pastry on the steel plate and rolled the back with a rolling pin.

For a mug, the invention has a big advantage over embossing or stamping because a smooth inside is clearly preferable to an indented inside, if only because it is easier to clean. Further, it was possible to use the same steel plate for two sizes of mug, though the price is a plain area above the scene on the larger mug. (The larger diameter also creates a plain area between the two ends of the scene, but it hardly notices as it is underneath the handle.) However, for the machine to work properly, the nut "N" would have to be set each time to position the tool head accurately within a fraction of a millimetre. Too close to the bed plate and you will end up with holes in the Britannia metal; too far away and metal won't get forced into the indentations on the steel plate. The difficulty in using the machine may explain why the invention did not appear to catch on.

As the two inventors practised different trades, the partnership Carpendale & Middleton (PS1512), mentioned in 1862, could well have been created by them to exploit this invention. Why, then, was Middleton's name dropped from the final patent filing? A clue comes from the fact that it was made outside the six months allowed for filing the Complete Specification. Patent law provided that where a patent applicant died during the period of provisional protection, the executors automatically got a three month extension to the period for filing the Complete Specification. Thus it seems likely that Middleton died during 1862 and his share of the patent rights was taken over by Carpendale. That would also explain why the maker's name on this mug is not Carpendale & Middleton but J Carpendale & Co (PS14961), a business Carpendale presumably set up after Middleton's death.