Sept. 4, 1956 W. H. BOWDEN 2,761,407

PRESS AND METHOD OF DRAWING TWO DEPRESSIONS IN FLAT SHEET MATERIAL

Filed Jan. 2, 1952

3 Sheets-Sheet 1

FIG. 1

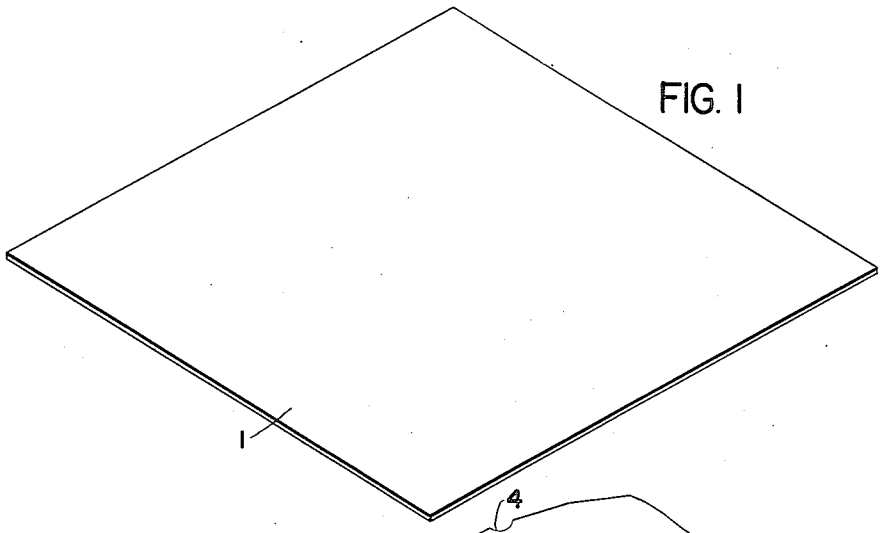


FIG. 2

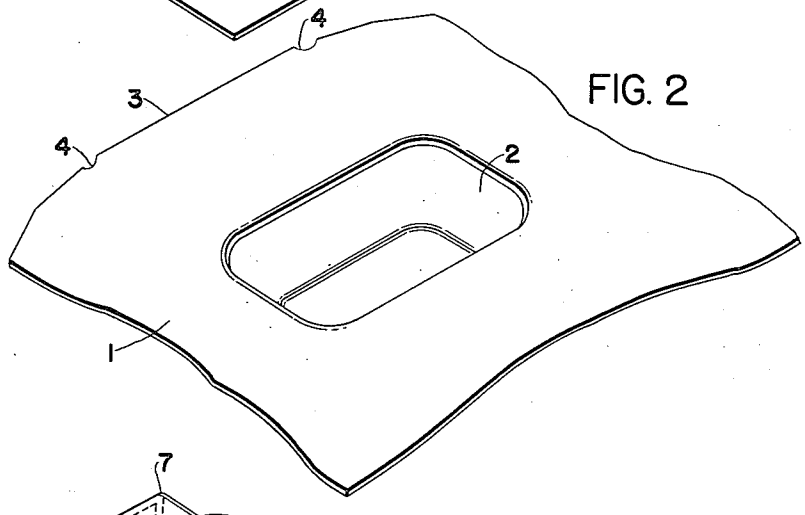
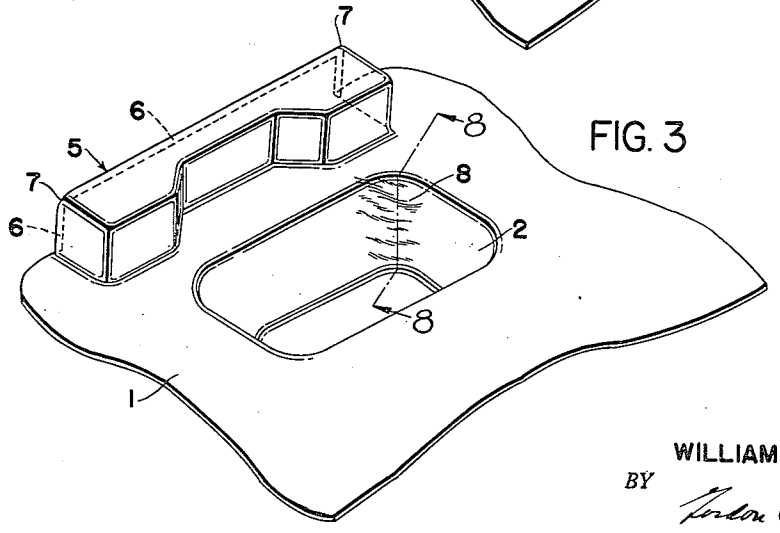


FIG. 3



INVENTOR.

WILLIAM H. BOWDEN

BY Gordon C. Mack

ATTORNEY

Sept. 4, 1956 W. H. BOWDEN 2,761,407

PRESS AND METHOD OF DRAWING TWO DEPRESSIONS IN FLAT SHEET MATERIAL

Filed Jan. 2, 1952 3 Sheets-Sheet 2

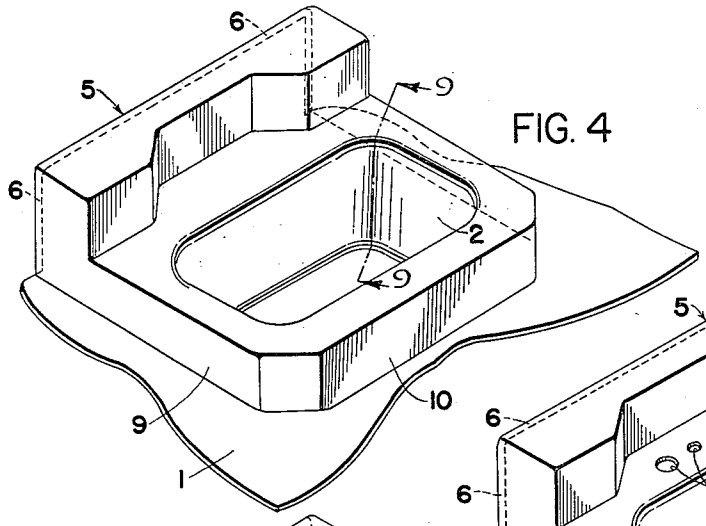


FIG. 4

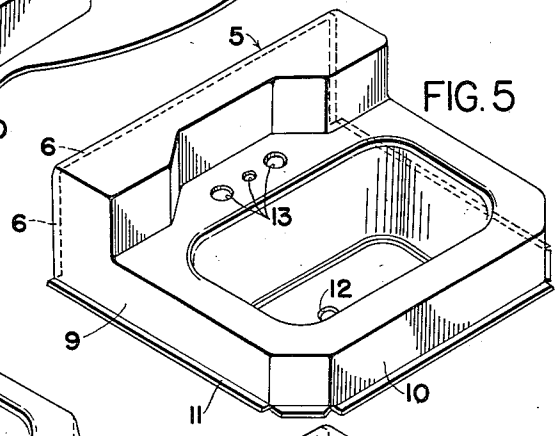


FIG. 5

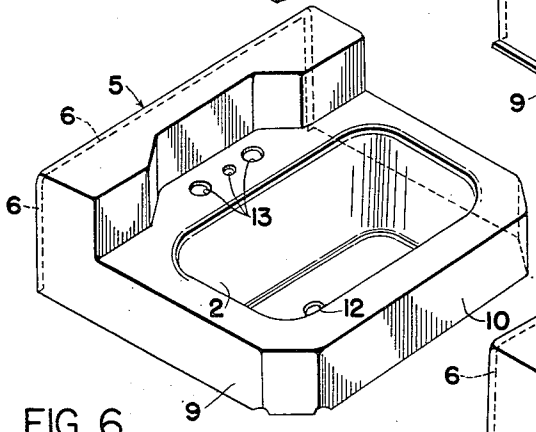


FIG. 6

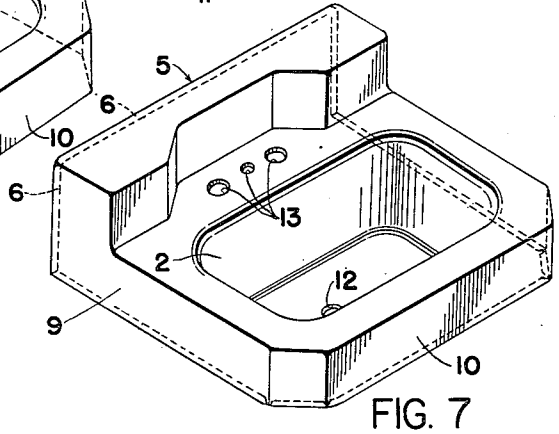


FIG. 7

FIG. 8

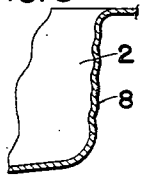
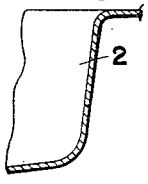


FIG. 9



INVENTOR.
WILLIAM H. BOWDEN
BY Gordon C. Mack
ATTORNEY

Sept. 4, 1956 W. H. BOWDEN 2,761,407

PRESS AND METHOD OF DRAWING TWO DEPRESSIONS IN FLAT SHEET MATERIAL

Filed Jan. 2, 1952 3 Sheets-Sheet 3

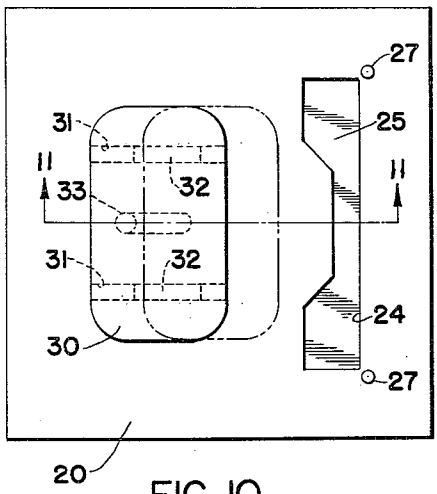


FIG. 10

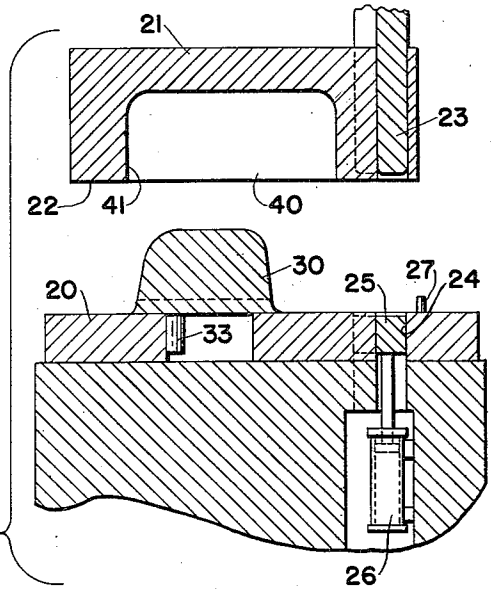


FIG. 11

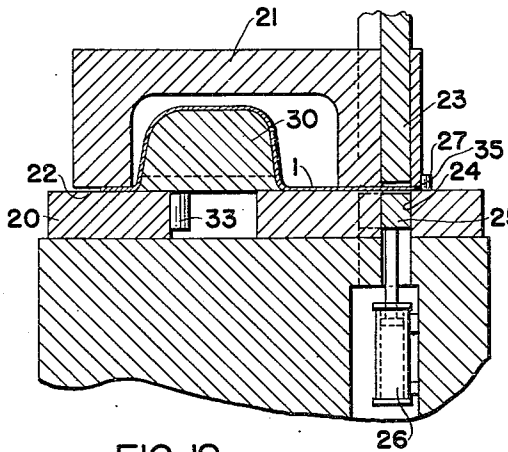


FIG. 12

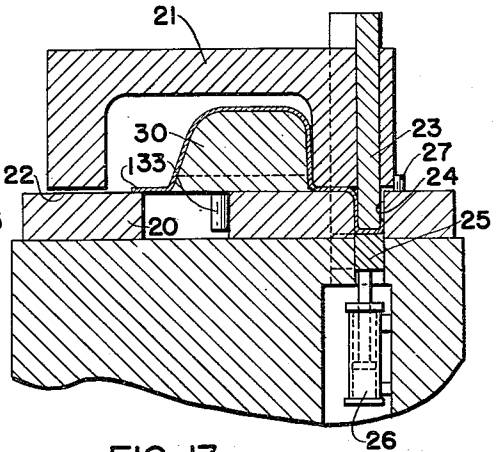


FIG. 13

INVENTOR.

WILLIAM H. BOWDEN

BY Gordon C. Clark

ATTORNEY

United States Patent Office 2,761,407 Patented Sept. 4, 1956

2,761,407

PRESS AND METHOD OF DRAWING TWO DEPRESSIONS IN FLAT SHEET MATERIAL

William H. Bowden, Alliance, Ohio, assignor, by mesne assignments, to Alliance Ware, Inc., Alliance, Ohio, a corporation of Delaware

Application January 2, 1952, Serial No. 264,557

8 Claims. (Cl. 113—51)

This invention relates to the manufacture of lavatories or sinks from sheet metal, and includes an improved press method used in the manufacture of the lavatory or sink. The invention includes the press operation whether in the manufacture of lavatories or sinks or other products.

The article manufactured includes a shelf back. Ordinary methods of drawing have not been found satisfactory for fabricating the well of the lavatory or sink in a sheet of metal and drawing the shelf back adjacent the well, because of the tendency of the ends of the shelf back to rupture. This difficulty has been overcome by the present method of forming the lavatory or sink, which includes the use of a sliding pilot. This pilot is used to interiorly support the well which is partially drawn before the shelf back, and prevents excessive distortion of the well during the drawing of the shelf back. The drawing of the well is then completed.

Notches are cut in the sheet to locate it in the press. In drawing the shelf back these notches are located adjacent the rear corners of the top of the shelf back, and are between flanges turned in at the top and sides of the shelf back and facilitate the formation of these flanges.

The steps of manufacturing the lavatory will be more fully discussed in connection with the drawings.

The sliding pilot is movably mounted on the platen of a press. The well of the lavatory fits over it. The pilot is located near the front of the platen at the start of the operation in which the shelf back is drawn, the means for drawing the shelf back being located toward the rear of this platen. The pressure pad is adjusted so that it does not hold the sheet metal too tight to prevent its sliding backward as necessary during the drawing of the shelf back. After the pressure pad has been lowered over the sheet metal, a punch which is fastened to the inner ram of the press draws the shelf back in the sheet metal, and as it does so the pilot moves rearwardly on the platen and the sheet moves with it. Thus, as the shelf back is drawn in the metal, the sheet with the well in it moves toward the shelf back, facilitating its formation and the pilot prevents any more than minimum distortion of the well.

The construction of the sliding pilot and its operation will be further described in connection with the accompanying drawings.

Figs. 1–7 are perspective views of the lavatory at different stages in its formation;

Fig. 8 is a section on the line **8**—**8** of Fig. 3;

Fig. 9 is a section on the line **9**—**9** of Fig. 4;

Fig. 10 is a plan view of the lower platen of the press;

Fig. 11 is a section on the line **11**—**11** of Fig. 10, showing the open press; and

Figs. 12 and 13 are similar sections, but show the press at different stages in the drawing of the shelf back.

Fig. 1 shows the sheet of metal or blank **1** from which the lavatory is to be drawn. This is preferably a sheet of high grade iron. It will be of the usual thickness, and its size will depend upon the size of the lavatory which is to be made.

In the first strike, this blank is developed by drawing the well **2** which is somewhat smaller than the well which is finally formed. It is perhaps one inch short of full

depth. Its area may be the area of the final well, although it may be somewhat smaller. The blank is developed by trimming the back to form a straight edge **3** and the locating notches **4**.

The sheet is then inverted and the well is placed over the sliding pilot, as will be more fully explained in the discussion of Figs. 10 and 11. The shelf back **5** is then drawn into the rear of the sheet. The flanges **6** along the top and sides of the rear of the shelf back are simultaneously formed. This will be discussed in detail in connection with the explanation of Figs. 10 to 13. The notches **4** are so located that in the final lavatory they come exactly at the corners **7** at the top rear of the shelf back. Without notching, these corners would not be smooth.

Drawing the shelf back distorts the well somewhat, as shown in Figs. 3 and 8 by the wrinkles **8** which are produced in the back corners of the well. In the next step the well is re-struck to extend it to its final depth and shape, and it is enlarged sufficiently to remove the wrinkles. It is then placed in another die and the sides **9** and front **10** of the lavatory are wiped down. This is done with a double-action draw die. The resulting product is shown in Fig. 4.

In the the next operation the edges are trimmed to produce the narrow flange **11**, the drain hole **12** is punched in the bottom of the well, and the openings **13** are provided for the fixtures. The narrow flange **11** is then wiped down straight to produce the product illustrated in Fig. 6. In the final operation a cam flange turns the flange **11** inwardly along the front and sides of the lavatory.

The lavatory is now ready for pickling or whatever treatment is necessary prior to enameling, and then enameling, which may be done in any usual manner.

The operation of the sliding pilot which is used in drawing the shelf back is illustrated in Figs. 10 to 13.

Fig. 10 is a plan view of the lower platen **20** and Fig. 11 is a section showing the platen **20** with the upper platen **21** above it. Figs. 12 and 13 show the sliding pilot at different locations in different stages in the formation of the shelf back.

The bottom **22** of the upper platen serves as a pressure pad. The punch **23** is fastened to the inner ram. It operates in the opening **24** of the lower platen in which there is a pressure plate **25** which is supported pneumatically by a cylinder **26** or the like. (The air connections and other details of the cylinder are not shown.) The locating pins **27** are positioned at the rear of the lower platen.

The sliding pilot **30** is shaped so that the well **2**, after the first draw, fits rather snugly over it. It supports the well interiorly. There are keyways **31** in the bottom of the sliding pilot and these slide on keys **32** which are fastened to the platen. The stop **33** limits the movement of the sliding pilot.

After the first strike and after the back edge **3** of the lavatory has been trimmed and the notches **4** have been cut (as illustrated in Fig. 2), the sheet is inverted and the partially drawn well **2** is placed over the sliding pilot. The notches **4** fit against the locating pins **27**. The upper platen is then lowered as shown in Fig. 12. It may come down to the sheet. Then the punch **23** is forced down to draw the shelf back. The final position of the parts of the press is illustrated in Fig. 13.

Fig. 12 shows the sheet when formed as in Fig. 2, inverted over the sliding pilot **30**, with the pressure pad lowered. The punch **23** is then forced down on the sheet against the pressure plate **25**. As the punch sinks in the opening **24** below the level of the top of the lower platen, the narrow portion **35** of the sheet which in Fig. 12 is shown between the back of the opening **24** and the locating pins **27** is drawn down into the opening and turned upwardly. As the sheet is drawn into the opening, the

thin strips outside the notches are turned in to form flanges at the back of the shelf back. The notches are between these side flanges and that formed across the top of the shelf back. Without these notches there would be excess metal at the corners and the flanges would pucker. Because of the notches, the flanges are easily formed and project inwardly from the top and sides of the shelf back. As the shelf back and flanges are drawn into the sheet the forward portion of the sheet moves rearwardly between the pressure pad and the lower platen. The well **2** moves backward as a part of this sheet, and slides the sliding pilot **39** with it. The wall **41** of the opening **40** in the upper platen limits the extent of the backward movement of the sliding pilot and well. It tends to prevent the sheet from being drawn away from the rear wall of the pilot **30**. The final position of the various parts of the press is shown in Fig. 13. The appearance of the sheet after completion of this operation is illustrated in Fig. 3.

There is nothing to hold the rear wall of the well **2** tight against the rear face of the pilot **30** as it moves backward. Although the rear face **41** of the opening tends to do this after the pilot contacts it, there is some distortion of the well and wrinkles **8** are formed in its rear corners as its rear wall is pulled slightly away from the rear surface of the sliding pilot. These wrinkles are removed in the second strike, as previously described. Figs. 4 and 9 show the well after the second strike. This strike enlarges the well sufficiently to remove the wrinkles.

The cylinder **26** is advantageously equipped in any usual way to have the pressure plate **25** serve as a kick-out to push the depressed portion of the plate cut of the cavity as soon as the pressing operation has been completed.

What I claim is:

1. The method of drawing a lavatory or sink from sheet metal, which comprises drawing a well in the metal somewhat smaller than the final well, then drawing a shelf back in the sheet at a distance from the well while supporting the well interiorly to limit the amount its depth can be reduced and simultaneously drawing the well toward the shelf back, and thereafter enlarging the well to its final dimensions, the shelf back being offset from the nearest wall of the well on completion of the method.

2. The method of forming a lavatory or sink from sheet metal, which comprises drawing a well in the sheet somewhat smaller than the final well, drawing a shelf back to the rear of the well and at a distance from the well while supporting the well interiorly to limit the amount its depth can be reduced and simultaneously drawing the well toward the shelf back, the shelf back being offset from the nearest wall of the well on completion of the method, and also simultaneously wiping the back edge of the sheet downward to form a flange perpendicular to the original plane of the sheet.

3. The method of drawing a lavatory or sink from a sheet metal blank, which comprises drawing a well in the blank, trimming the rear edge straight and producing two notches in the rear edge of the sheet near the ends of said straight edge, and thereafter in one operation both drawing a shelf back to the rear of the well and at a distance from the well with the notches located symmetrically with respect to the rear corners of the top of the shelf back and simultaneously bending narrow strips of the sheet in perpendicularly to the top and sides of the shelf back to form flanges at the back and sides of the shelf back with the notches between the side and back flanges, and also simultaneously drawing the well toward the shelf back while supporting it interiorly, the shelf back being offset from the nearest wall of the well on completion of the method.

4. A drawing press which includes two platens adapted to meet with the metal being worked and located between them, one of which platens, serving as a pressure pad, includes a punch movably supported therein, an opening in the other platen to receive the punch when it is moved out of the first platen toward the second platen, and a pilot slidably supported on one of the platens and adapted to be moved toward and away from the opening, with an opening in the platen which does not support the pilot, which latter opening is at a distance from the first opening and is larger than the pilot so that the pilot is movable in said latter opening when the metal being worked is between the pilot and the wall thereof.

5. A press the lower platen of which has an opening toward the rear, a pilot slidably mounted on the lower platen by means of parallel keys and keyways directed toward the opening, a punch in the upper platen which punch is adapted to move out of the upper platen into the opening in the lower platen, and a single opening in the underside of the upper platen which accommodates the pilot when located in any position on the lower platen to which it may be slid, with the metal being worked between the pilot and the wall of the opening, the undersurface of the upper platen around the opening serving as a pressure pad.

6. The method of drawing a lavatory or sink from sheet metal, which comprises drawing a well in the metal and then drawing a shelf back in the sheet at a distance from the well while supporting the well interiorly to limit the amount its depth can be reduced, and simultaneously moving the well toward the shelf back by drawing into the shelf back sheet metal which separated the well from the area where the shelf back is formed.

7. A drawing press for a lavatory or sink which includes two platens, one of which serving as a pressure pad includes a punch for a shelf back movably supported therein, an opening in the other platen to receive the punch when it is moved out of the first platen toward the second platen, and a pilot somewhat shallower than the well to be formed in the lavatory or sink slidably supported on the second platen and adapted to move toward and away from the opening, with a second opening in the first platen located at a distance from the first opening, which second opening is larger than the pilot and accommodates the pilot in any position with the metal being worked located between the pilot and the wall of the second opening.

8. The method of drawing two depressions in substantially flat sheet metal, which comprises first drawing one of the depressions, and thereafter drawing the second depression and in so doing moving metal from the first depression toward the second depression and simultaneously moving metal located between the first depression and the station of the second depression into the second depression, while supporting the first depression interiorly to limit the amount its depth is reduced.

References Cited in the file of this patent

UNITED STATES PATENTS

1,623,467	Edwards	Apr. 5, 1927
2,064,160	Hochreiter	Dec. 15, 1936
2,085,189	Graf	June 29, 1937
2,089,476	Grotnes	Aug. 10, 1937
2,105,944	Graf	Jan. 18, 1938
2,120,094	Graf	June 7, 1938
2,210,933	Graf	Aug. 13, 1940
2,246,204	Graf	June 17, 1941
2,272,511	Coordes	Feb. 10, 1942
2,305,866	Graf	Dec. 22, 1942
2,350,119	Kotcher	May 30, 1944
2,397,582	Watt	Apr. 2, 1946
2,488,828	Pilliner	Apr. 22, 1949
2,495,130	Pilliner	Jan. 17, 1950

FOREIGN PATENTS

517,829	Germany	Sept. 10, 1929
577,136	Germany	May 24, 1933
681,196	Germany	Sept. 19, 1939
697,849	Germany	Oct. 24, 1940