Oct. 27, 1942. R. W. FAULHABER 2,300,380

PROCESS AND APPARATUS FOR MAKING CYCLE SADDLES

Filed June 17, 1941 2 Sheets-Sheet 1

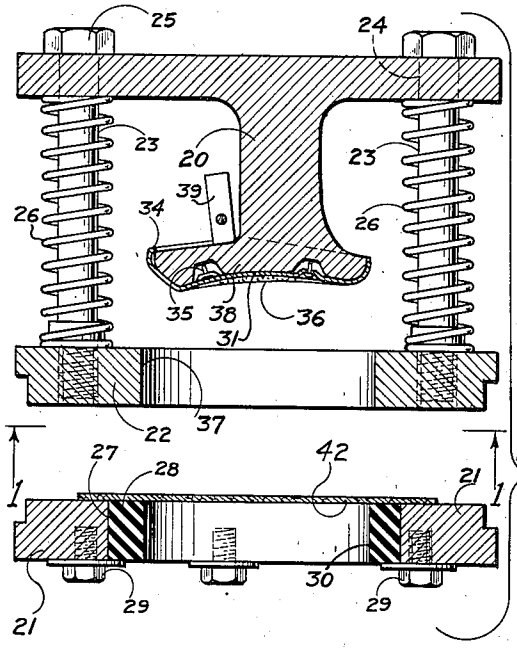


FIG.-2

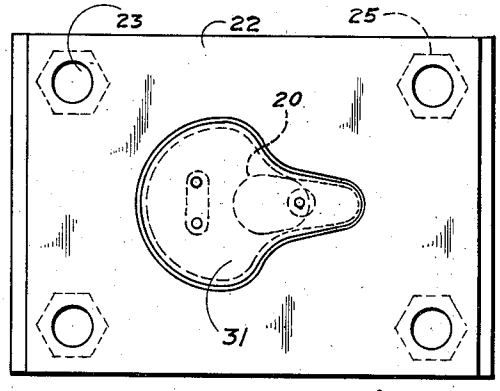


FIG-1

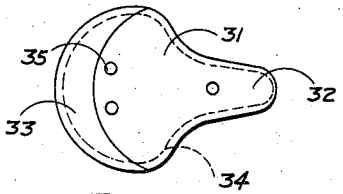


FIG.-5

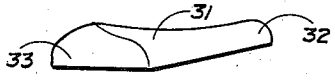


FIG.-6

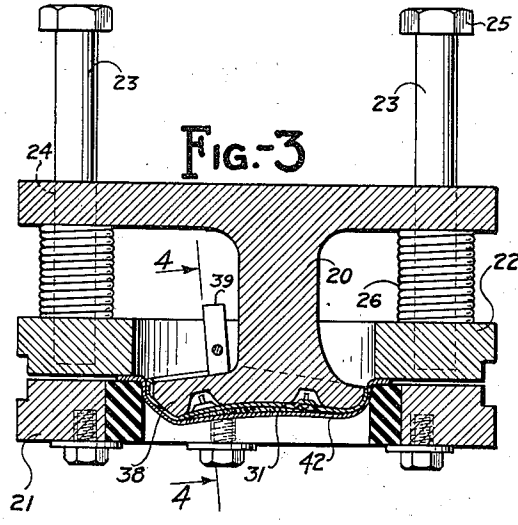


FIG.-3

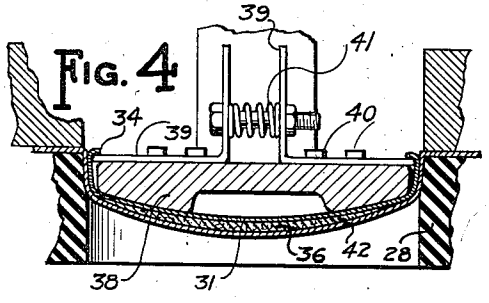


FIG. 4

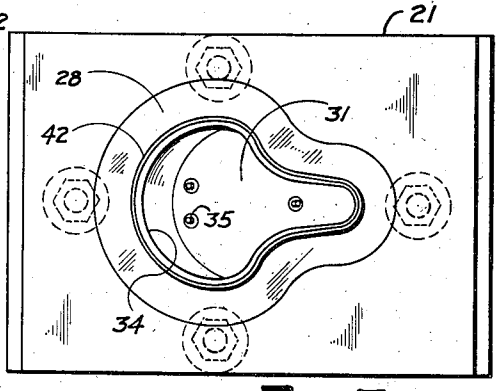


FIG.-7

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PROCESS AND APPARATUS FOR MAKING CYCLE SADDLES

Filed June 17, 1941 2 Sheets-Sheet 2

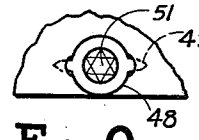


FIG.-9

FIG.8

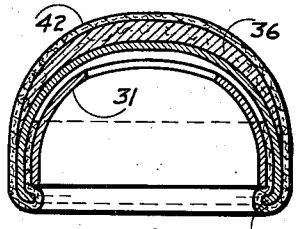


FIG.-11

FIG.10

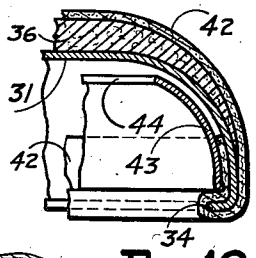


FIG.-12

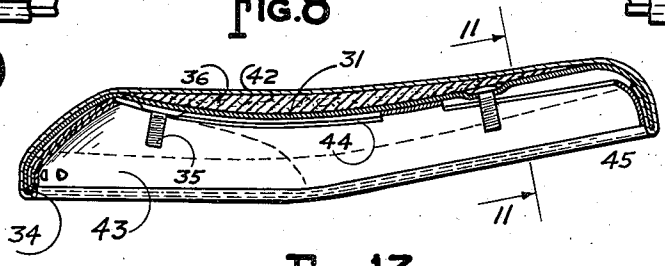


FIG.-13

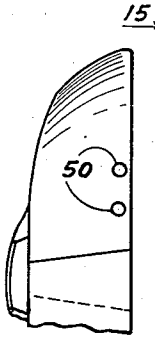


FIG.-15

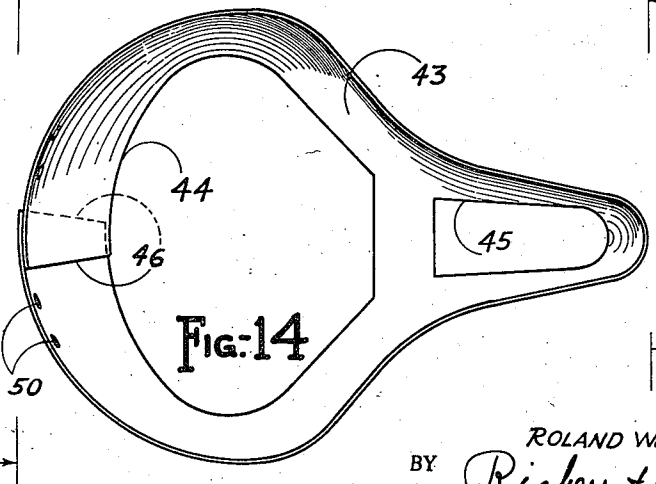


FIG.-14

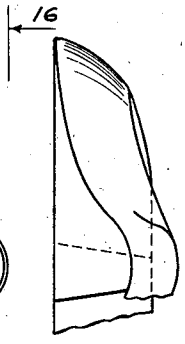


FIG.-16

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UNITED STATES PATENT OFFICE

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PROCESS AND APPARATUS FOR MAKING CYCLE SADDLES

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Application June 17, 1941, Serial No. 398,445

18 Claims. (Cl. 69—8)

This invention relates to a method of making and assembling bicycle saddles and the like.

It has been customary heretofore to make the seat portions of bicycle saddles and the like from a metal frame or base, padding or cushioning material disposed upon the frame or base plate, and a covering of flexible material such as imitation leather, leather and similar materials disposed over the padding and secured by stitching or other means to the frame or base plate. To secure the covering material smoothly and tightly to the irregular contours of the saddle it has been customary heretofore to shape the covering material under high pressure between dies, the material having previously been wet or otherwise treated as necessary to make it retain the shape imparted to it. The shaped covering material is then assembled over the base plate and padding and secured in position in the desired manner.

The present invention has for its objects to simplify and reduce the cost of the operations involved in assembling and securing together the parts of a seat of this type, and also to obtain a smoother, tighter, more permanent and durable covering of the seat member. Other objects are to arrange the covering in such a manner as to provide a smooth finished edge on the seat free of unsightly binding strips, rivets, stitching and the like; to improve and simplify the method of securing the cover in position after it has been assembled on the seat and padding; and to improve and simplify the method and apparatus for assembling a seat. Other objects will appear in the following detailed description of the preferred method and apparatus for practicing this invention.

In the accompanying drawings,

Figure 1 is a bottom plan view of a die looking in the direction of the arrows 1—1 of Figure 2;

Figure 2 is a vertical section through a portion of the press for carrying out this invention showing the upper die raised or separated from the lower die;

Figure 3 is a view similar to Figure 2 showing the parts at the end of the working stroke of the press;

Figure 4 is a section taken on the line 4—4 of Figure 3;

Figure 5 is a bottom plan view of a base plate or frame for a seat;

Figure 6 is a side elevation of the same;

Figure 7 is a plan view of the bottom die with the seat assembled therein removed from the press;

Figure 8 is a bottom plan view of an assembled saddle;

Figure 9 is a detail elevation taken on the line 9—9 of Figure 8;

Figure 10 is a detail elevation taken on the line 10—10 of Figure 8;

Figure 11 is a section taken on the line 11—11 of Figure 8;

Figure 12 is a section taken on the line 12—12 of Figure 8;

Figure 13 is a longitudinal section taken on the line 13—13 of Figure 8;

Figure 14 is a plan view of the fastening member used to secure the covering to the base;

Figure 15 is an end view taken on the line 15—15 of Figure 14; and

Figure 16 is an end view taken on the line 16—16 of Figure 14.

I prefer to carry out my invention by the use of an ordinary press having a reciprocating punch slide and a blank holder or pressure pad. The punch is provided with means to support the base plate of the seat, and the die is provided with an opening shaped to receive and frictionally grip the edges of the assembled base plate and covering material. The flat sheet of covering material is placed upon the die and the base plate is mounted on the punch. When the pressure pad and punch descend against the die the pressure pad first grips the edges of the sheet of covering material, and the base plate of the seat is then forced by the punch into the opening in the die. The base plate draws with it the covering material which is pulled from between the upper surface of the die and the pressure pad and is thereby pulled tightly around the base plate. The punch and pressure pad then return to their retracted positions leaving the seat and covering material tightly gripped in the opening in the die with the covering material stretched smoothly and tightly over the seat and padding. I prefer to use a series of dies and to remove each die from the press after a seat has been formed in it, so that each die may be passed on to the next operator and the covering material locked in position in the base plate while the press is forming another seat in another die.

Referring to the drawings, I have illustrated a reciprocating punch or ram 20 mounted upon suitable press mechanism so as to be reciprocated toward and away from a die 21, which may be positioned upon the bed frame or the like of the

press. A pressure pad 22 is shown as secured to rods 23 which extend slidably through apertures 24 in a portion of the punch and have their upper ends headed or shouldered as shown at 25 to support the pressure pad with respect to the punch. Springs 26 surround the rods 23 and cause the pressure pad 22 to be held down with a predetermined pressure. The die 21 is provided with an opening to receive and frictionally engage the covered seat. Preferably the die is formed with an opening 27 within which a rubber ring 28 is secured in any suitable manner, as by capscrews 29. The rubber ring 28 is formed with an opening 30 to fit the seat. The seat is preferably formed from a sheet metal base member 31 which is drawn to the desired shape and which, as illustrated, includes an upper seat surface, a narrow nose portion 32 and a flared skirt 33 at the rear portion. The edge of the base member is formed with an inturned flange 34 throughout the greater portion of its periphery. Inwardly projecting bolts 35 may be secured to the base 31 to provide means for attaching the springs to the finished seat. Cushioning or padding material 36 is provided and is preferably cemented or otherwise secured to the upper surface of the base 31 to hold it in position during the covering operation.

The pressure pad 22 of the press is formed with an opening 37 shaped to conform to the outline of the base 31 but of sufficient size to permit the base to pass therethrough. The punch 20 includes a downwardly projecting head 38 which is shaped to enter the base member 31 from the underside and distribute pressure over the inner surface of the base member. As shown in Figures 2, 3, and 4 the head 38 is small enough to pass within the inturned flange 34 of the base member and carries spring pressed latches 39 arranged to engage under the flange 34 and hold the base on the punch. As illustrated, the latches 39 are slidably mounted in guides 40 on the head 38, and have upturned spaced ends pressed apart by a spring 41.

After the base member 31 has been formed and the padding 36 secured thereto, it is placed over the head 38 of the punch 20 and retained in position by snapping the latches 39 under the flange 34. A sheet 42 of suitable covering material is then laid over the die 21 and centered over the opening 30. The press is then tripped to cause the punch 15 to descend. The pressure pad 22 first engages the edges of the sheet 42 of covering material and grips these edges against the upper surface of the die 21. Continued movement of the punch causes the same to slide on the rods 23 so that the pressure pad 22 remains in position gripping the edges of the covering material, under the pressure determined by the strength of the springs 26 while the head 38 pushes the base member 31 through the opening 37 in the pressure pad and into the opening 30 in the die 21. This movement of the base member 31 engages the sheet of covering material 42 and draws the same into the die. Movement of the covering material is resisted by the frictional grip of its edges between the pressure pad 22 and the die 21, so that the covering material is stretched and pulled tightly and smoothly about the base member 31 and the padding 36. As soon as the base member enters the opening 30 in the rubber ring 28 of the die, additional stretching and forming force is exerted on the covering material 42 by the friction of the rubber ring. The opening 30 conforms to the contour of the seat and is made sufficiently smaller than the base 31 and covering material 42 to exert the desired tension on the covering material. This tension is exerted uniformly about the irregular shape of the base and acts to smooth out all wrinkles and impose a tension on the material that is substantially uniform in all directions and in all parts of the seat.

At the completion of the stroke the parts are in substantially the position illustrated in Figure 3 with the covering material 42 stretched and pulled tightly and smoothly about the base member 31 and the padding 36 and held in this position by the frictional grip provided by the rubber ring 28 around the entire periphery of the base member 31. It will be understood that the base can be pushed as far into the die opening 30 as is necessary to properly smooth the covering material and clamp the same in position.

The punch 20 and pressure pad 22 are then retracted, completing the cycle of the press. When the punch moves upwardly, the latches 39 snap out of their position beneath the flange 34, leaving the base and covering material in the die with the free edge of the material projecting past the edge of the base. In accordance with the preferred method of manufacture the die 21 with the assembled seat clamped therein is removed from the press and conveyed to a position or station at which the securing of the covering material is completed. Another similar die is then placed on the bed frame of the press and the operation is repeated.

The die 21 removed from the press with the assembled seat frictionally gripped therein is illustrated in Figure 7. To complete the seat the free edge of the covering material is turned inwardly and secured in place in any desired manner, after which the completed seat is forced out of the die and the die returned to the press to be used again. Thus the covering of the seat is completed without soaking, pressing, or other preliminary operations on the covering material, and a smoother, tighter covering job is obtained than is possible with the methods and apparatus heretofore used.

A preferred arrangement for securing the free edge of the covering material in position and completing the seat is illustrated in Figures 8 to 16 inclusive. While the seat remains in the die 21, the edge of the covering material is turned inwardly and secured by a sheet metal retainer 43. This retainer comprises a skeleton sheet metal member shaped to the general conformation of the under side of the base. It is preferably made by die stamping from a resilient spring metal and is provided with a large opening 44 in the wide rear portion and a smaller opening 45 in the nose. The rear of the frame portion is split as indicated at 46 with the two parts adjacent the split overlapping.

The retainer is made of a size sufficiently large so that it must be pressed into position on the underside of the saddle base past the flange 34. The resiliency of the retainer causes it to press outwardly against the inturned portion of the seat covering throughout the entire periphery of the base. The height of the retainer is sufficient to cause its lower edge to compress and grip the covering material against the upper surface of the flange 34. When the retainer is pressed into the seat past the flange 34, it exerts sufficient friction on the covering material to pull it tightly around the flange. Thus the ten-

sion imposed on the material by the die is not released and the cover is firmly secured in place.

The split ends **46** when once secured in position are held in place by members **47** which are provided with prongs **49**, which prongs extend through the covering, through holes in the base, and aligned holes **50** in the retainer member. The prongs are then bent outwardly or laterally, as best shown in Fig. 10, to secure the same in position. The locking members may each be provided with a bezel **48** which holds a road reflector glass **51** in position on the rear of the seat.

Although I have described a preferred embodiment of my invention in considerable detail, it will be understood that many variations can be made therein. For example, the opening **30** in the die may be formed in any material which will provide the desired frictional grip on the covering material, although the rubber ring **28** is preferred. Metal may be used by carefully shaping the opening to have just the desired clearance, less than the thickness of the covering material, around the entire base, but a yieldable substance is preferred because the shaping of the opening need not be so exact, and because it will accommodate a considerable manufacturing tolerance in the size and shape of the base members. Likewise, any desired means may be employed for securing the free edge of the covering material to the base, so long as the edge is pulled tight and fastened before the gripping force of the die is released. Many other modifications may be resorted to without departing from the scope of the invention as defined in the following claims.

I claim:

1. The process of making seats for cycle saddles and the like comprising frictionally gripping the edges of a sheet of flexible covering material, forcing a base member against said material so as to pull said edges free and simultaneously pull said covering material tightly about said base member, and securing the edges of said covering material to said base member.

2. The process of making seats for cycle saddles and the like comprising frictionally gripping the edges of a sheet of flexible covering material, forcing a base member against said material so as to pull said edges free and simultaneously pull said covering material tightly about said base under tension, and securing the edges of said covering material to said base member before releasing the tension.

3. The process of making a seat or the like comprising disposing a sheet of flexible covering material over an aperture in a forming member, frictionally gripping the edges of said sheet of material around said aperture, forcing a base member against said covering material and into said aperture so as to pull said edges free and simultaneously pull said covering material tightly about said base member, and securing the edges of said covering material to said base member.

4. The process of making a seat or the like comprising disposing a sheet of flexible covering material over an aperture in a forming member, frictionally gripping the edges of said sheet of material around said aperture, forcing a base member against said covering material and into said aperture so as to pull said edges free and simultaneously pull said covering material tightly about said base member under tension, and securing the edges of said covering material to said base member before releasing the tension.

5. The process of making a seat for a cycle saddle or the like comprising disposing a sheet of flexible covering material over an aperture in a forming member of such size and shape as to frictionally grip the assembled seat around its entire periphery, forcing a base member against said material and into said aperture so that the edges of said aperture in the forming member grip the covering material against a periphery of the base member and pull the covering material tightly over the base member, and securing the free edges of said covering material to said base member.

6. The process of making a seat or the like comprising disposing a sheet of flexible covering material over an aperture in a forming member of such size and shape as to frictionally grip the assembled seat around its entire periphery, forcing a base member against said material and into said aperture so that the edges of said aperture in the forming member grip the covering material against the periphery of the base member and stretch said material tightly over the base member, securing the edges of the covering material to the seat while the base member and covering material are gripped in said aperture, and thereafter removing the assembled seat from the aperture.

7. The process of making a seat for a cycle saddle or the like comprising disposing a sheet of flexible covering material over a resilient forming member having walls defining an aperture of such size and shape as to frictionally grip the assembled seat around its entire periphery, forcing a base member against said material and into and along the walls of said forming member defining said aperture so that said walls grip the covering material against the periphery of the base member and pull the covering material tightly over the base member, and securing the free edges of said covering material to said base member.

8. The process of making a seat for a cycle saddle or the like comprising disposing a sheet of flexible covering material over a rubber forming member having walls defining an aperture of such size and shape as to frictionally grip the assembled seat around its entire periphery and of greater depth than the periphery of the assembled seat, forcing a base member against said material and into and along said walls defining said aperture so that said walls grip the covering material against the periphery of the base member and pull the covering material tightly over the base member, and securing the free edges of said covering material to said base member while the base and covering material are gripped by said walls.

9. The process of making a seat for a cycle saddle or the like comprising covering a base member with flexible covering material by disposing a sheet of covering material over a die having walls defining an opening of such size as to frictionally grip the periphery of the assembled base member and covering material, gripping the edges of said sheet of covering material around the opening in the die, forcing the base member against the covering material and into the opening in said die so as to pull the covering material tightly about the base member and grip the covering material between the base member and the walls of the die defining the opening and securing the free edges of the covering material to the base member.

10. The process of making a seat for a cycle saddle or the like comprising covering a base

member with flexible covering material by disposing a sheet of covering material over a die having resilient walls defining an opening of such size as to frictionally grip the periphery of the assembled base member and covering material, gripping the edges of said sheet of covering material around the opening in the die, forcing the base member against the covering material and into and along the walls of said die defining the opening so as to pull the covering material tightly about the base member and grip the covering material between the base member and the walls of the die defining the opening, and securing the free edges of the covering material to the base member.

11. The process of making a seat for a cycle saddle or the like comprising covering a base member with flexible covering material by disposing a sheet of covering material over a die having rubber walls defining an opening of such size as to frictionally grip the periphery of the assembled base member and covering material, gripping the edges of said sheet of covering material around the opening in the die, forcing the base member against the covering material and into and along the walls of said die defining the opening so as to pull the covering material tightly about the base member and grip the covering material between the base member and the rubber walls of the die defining the opening securing the free edges of the covering material to the base member while the base member and covering material are gripped in the die, and removing the assembled seat from the die.

12. The process of making a seat or the like comprising forming a metal base member with a depending skirt terminating in an inturned flange, stretching a sheet of covering material over the convex side of said base member by gripping the covering material between the skirt of said base member and a frictional surface and moving said base member relative to said surface, turning the edge of the covering material inwardly over the inturned flange of said base member, and securing the free edge of said covering material to the base member.

13. The process of making a seat or the like comprising forming a metal base member with a depending skirt terminating in an inturned flange, stretching a sheet of covering material over the convex side of said base member by gripping the covering material between the skirt of said base member and a frictional surface and moving said base member relative to said surface, turning the edge of the covering material inwardly over the inturned flange of said base member, and forcing a retaining member into the concave side of the base member so as to grip the covering material between the retaining member and the base member.

14. The process of making a seat or the like comprising forming a metal base member with a depending skirt terminating in an inturned flange, stretching a sheet of covering material over the convex side of said base member by gripping the covering material between the skirt of said base member and a frictional surface and moving said base member relative to said surface, turning the edge of the covering material inwardly over the inturned flange of said base member, and forcing a retaining member into the concave side of the base member so as to frictionally engage the covering material at the edge of said inturned flange and pull the material tightly about the flange, and seating said retaining member under said inturned flange to grip the covering material between the retaining member and the base member.

15. The process of making a seat or the like comprising forming a metal base member with a depending skirt terminating in an inturned flange, stretching a sheet of covering material over the convex side of said base member by gripping the covering material between the skirt of said base member and a frictional surface and moving said base member relative to said surface, turning the edge of the covering material inwardly over the inturned flange of said base member, and, before releasing the stretching force applied by said frictional surface, forcing a retaining member into the concave side of the base member so as to frictionally engage the covering material at the edge of said inturned flange and pull the material tightly about the flange, and seating said retaining member under said inturned flange to grip the covering material between the retaining member and the base member.

16. Apparatus for making cycle seats and the like comprising a die having an opening extending therethrough, the opening having the shape of the desired external contour of the finished seat, and a punch arranged to force a seat base member and a sheet of covering material into the opening in said die, the walls of said die defining said opening being arranged to frictionally grip said covering material and pull the same tightly about said base member as the base member is forced into said opening.

17. Apparatus for making cycle seats and the like comprising a die of resilient material having an opening extending therethrough, the opening having the shape of the desired external contour of the finished seat, and a punch arranged to force a seat base member and a sheet of covering material into the opening in said die, the resilient walls of said die defining said opening being arranged to frictionally grip said covering material and pull the same tightly about said base member as the base member is forced into said opening.

18. Apparatus for making cycle seats and the like comprising a die having an opening extending therethrough, the opening having the shape of the desired external contour of the finished seat, a pressure pad arranged to yieldably grip the edge of a sheet of covering material against the surface of said die, and a punch arranged to force a seat base and the sheet of covering material gripped by said pressure pad into the opening in said die and thereby pull said material from between said pressure pad and the surface of said die, the walls of said die defining said opening being arranged to frictionally grip said material against the periphery of said base member.

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