Feb. 11, 1958 K. HUFF ET AL 2,822,572

APPARATUS FOR MAKING RUBBER HEEL MOLDS

Filed May 23, 1955

Fig. 1

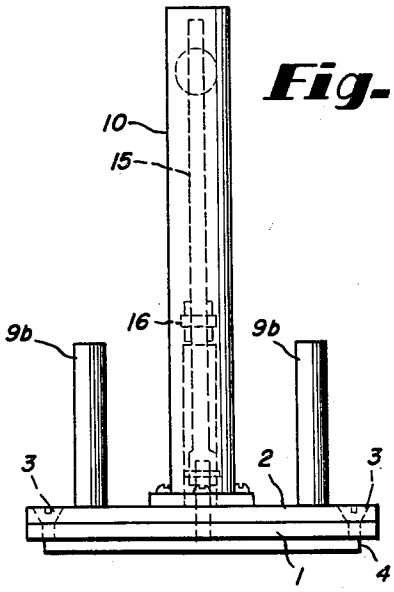


Fig. 3

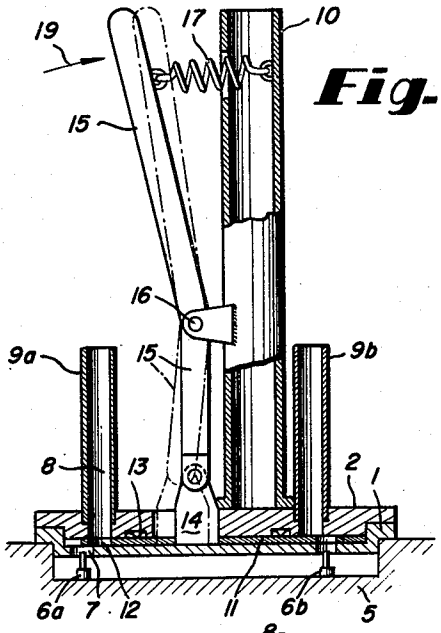


Fig. 2

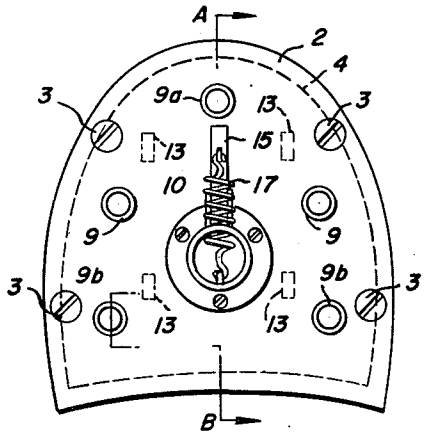


Fig. 4

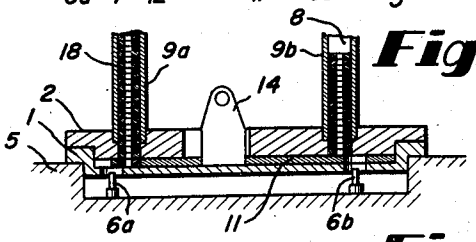


Fig. 5

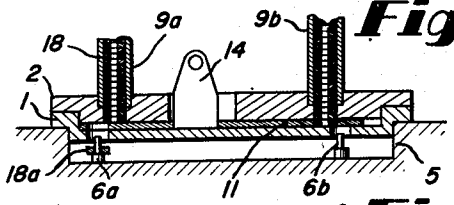


Fig. 6

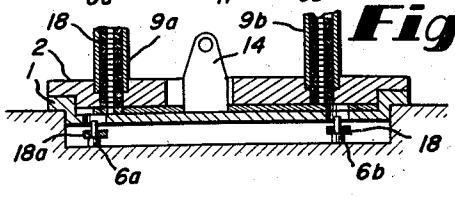
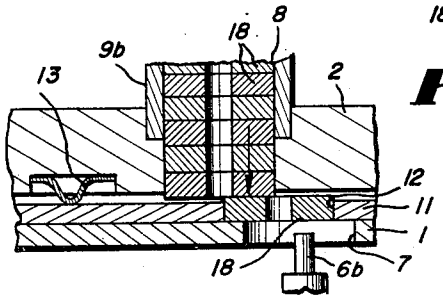


Fig. 7



INVENTORS
KARL HUFF
WILHELM EHLERS

BY Toulmin & Toulmin

Attorneys

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APPARATUS FOR MAKING RUBBER HEEL MOLDS

Karl Huff, Ahlem, near Hannover, and Wilhelm Ehlers, Sarstedt, Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hannover-Limmer, Germany

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4 Claims. (Cl. 18—1)

The invention relates to an apparatus for placing washers onto the male dies in rubber heel molds, which apparatus is distinguished from those known in the art by being especially simple and by being applicable with heel molds comprising a mold bottom and two cover plates with countersunk holes.

Rubber heel molds usually comprise an upper and a lower mold half, with male dies provided protruding upwardly from the lower mold plate so as to form openings into the heels through which nails and the like may be passed as protection against wear. Washers underlying the nail heads are placed in these openings, preferably during the molding process or immediately upon the completion of same. These washers are preferably press-seated in the material of the heel in which the nail openings are made. A plurality of openings in a rubber heel are arranged according to a certain "hole pattern."

The apparatus according to the invention is particularly characterized by the use of a single slide plate which is movable horizontally across the mold base containing the male dies which are mounted on the stationary bottom plate. Washers are fed into the openings of said slide plate from a tube-shaped washer magazine, whereupon the slide displaces the washers laterally into passage openings in the base plate arranged centrally about the dies. This slide is of uniform design for a particular hole pattern, so that by means of one single movement of the slide, all dies of the formed pattern are supplied with washers. In order to prevent slanting of the washers when falling through the passage openings, and thus to eliminate a faulty placing of the same on the dies, it is proposed, according to a further feature of the invention, to maintain the distance of the center of the washer magazine from the forming dies smaller than the diameter of the washers.

The arrangement of the nail holes in the rubber heel is a standard one and cannot be chosen or changed at random, since the further steps of elaboration by the nailing machine are adapted to the standard nail hole patterns. Therefore, in the apparatus according to the invention, sufficient marginal space on each side of the heel for working the marginal sections must be provided to render operation of the slide and slide guiding means sufficiently stable and suitable for achieving a reliable operative effect along that margin. This is achieved according to the invention by arranging the washer magazines so that they are alternately displaced in relation to the dies in such a manner that the washers may be released from part of the magazines at the forward and from the remaining magazines at the backward movement of the slide plate. The arrangement is such that the washer magazines which are arranged at the most remote position from one another, i. e., nearest to the margin of the heel mold, are displaced with relation to the corresponding dies toward the interior of the apparatus, thereby limiting the strokes of the lever **15** and the travel of the slide

plate **11** attached to the lower end thereof in either direction to the confines of the mold cavity. The openings in the slide plate are correspondingly displaced.

Thereby, equally satisfactory positions are provided for all washer magazines with regard to the "hole pattern" on the slide plate, so that it becomes possible to build an apparatus which functions safely mechanically and to guarantee a safe placing of the washers on the dies since it is possible to arrange the slide so that it passes directly over the dies.

The several objects and advantages referred to above will become more apparent upon reference to the accompanying drawings, in which:

Figure 1 is a front view of the apparatus according to the invention;

Figure 2 is a top view of the apparatus shown in Figure 1;

Figure 3 is a longitudinal sectional view along line A—B of Figure 2; and

Figures 4, 5, and 6 illustrate various operational positions of the slide plate shown in Figure 3.

Figure 7 illustrates, in an enlarged cross sectional view, the region of the magazine *9b* in Figure 3.

The casing of the apparatus consists essentially of the base plate **1** and the top plate **2** which are connected with one another at their edges by means of screws **3**. The base plate **1** is provided near its circumference with a centering rim **4** which insures its position relative to the mold **5**. In the mold **5**, the male dies *6a*, *6b* are rigidly mounted in order to form the holes for the nails in the rubber heels. Their lower portion is of a larger diameter than their upper part, the latter forming a supporting pin for the washers which are placed on the shoulder thus formed in the die. Centrally, in relation to these dies *6a*, *6b*, passage openings **7** are provided in the base plate **1** for the passage of the washers, which passages have a somewhat larger diameter than the washers themselves. Displaced to one side from the center of the passage openings, there are bores **8** provided in the top plate **2** whose diameter is also somewhat larger than that of the washers and the washer magazines, the displacement of these bores relative to the dies being in the same direction for all dies. Furthermore, the top plate bears a handle **10**.

Between the base plate **1** and the top plate **2**, a slide plate **11** is arranged with a little play, which slide plate is somewhat thinner than the washers. This slide plate is also provided with openings **12** which are somewhat larger in diameter than the washers and have the same distance relative to each other as the dies *6a* and *6b* according to their positions at the heel point and heel base, respectively or the magazines **8** and/or *9a*, *9b*. With regard to the washer magazines and dies, a distinction is made between a magazine *9a* being arranged at the heel point and a magazine *9b* near the heel base, while the dies are correspondingly designated with *6a* and *6b*, respectively. The slide **11** is urged permanently against the base plate **1** by means of small springs **13**. At its upper surface, it is provided with a projection **14** protruding through a slot in the top plate, which projection **14** engages an actuating double lever **15** pivotally mounted at the fulcrum **16** in the handle **10**. The lever **15** is urged backwardly into inoperative position by the spring **17**.

In its initial or resting position, the slide **11** occupies the position shown in Figures 3 and 4; i. e., its openings are vertically below the washer magazines **8** and/or *9a*, *9b*. These magazines are filled with washers **18**. In this case, the lowermost washer **18** from each magazine always falls through the opening **12** of the slide **11**. After the apparatus has been placed on the "hole pattern," the lever **15** is moved in the direction of arrow **19**, thus caus-

ing the slide plate **11** to occupy the position shown in Figure 5. The slide plate has thus been displaced to the left and has carried with it a washer in each of its openings. These washers now come to register with the passage opening **7** whereby they can drop down in the provided manner onto the shoulders of the dies **6**, thus occupying the position indicated at **18***a* in Figure 5.

The centers of the punching dies **6** and the washer magazines **8** and/or **9** must, of necessity, be displaced laterally with regard to one another; however, only by a distance smaller than the diameter of the washers. This has the advantage that the weight of the column of washers will press upon the lowermost laterally displaced washer until the last moment, thus maintaining the same in horizontal position and preventing any slanting and/or oblique dropping of the latter.

In the inoperative position of the slide plate **11** according to Figure 4, one passage opening of the same is located registering below the washer magazine **9***a* so that a washer may enter directly in the opening of the slide plate registering therewith. However, at the magazine **9***b* to the right, the exit from the magazine through the slide plate **11** is blocked. If the slide plate **11** is moved by actuating the hand lever **15** in the direction of arrow **19**, the slide will feed the washer inserted in its opening to register with the die **6***a* and cause the same to drop down on the latter. On the other hand, at the rear end of the slide (right side in Figure 4), the opening in the same below the magazine **9***b* registers with the latter and receives a washer therefrom. If the slide is moved from its position near the base of the heel (left side in Figure 4) to its position near the heel end (right side in Figure 4) by releasing the hand lever **15** and together therewith the spring **17**, the slide will feed with its right side end the washer inserted therein to the corresponding die **6***b* and cause the washer to drop down on the latter. After lifting the apparatus from a heel form pattern and placing the same anew on another one, the operation may be repeated.

With regard to the magazines located near the center of the heel, it is generally unimportant whether a washer is fed at the forward or return stroke of the slide.

Figure 7 illustrates, in cross sectional view, the part of Figure 3 comprising the magazine **9***b*. This figure illustrates how the pressure P from the column of washers **18** in magazine **9***b* holds the washer **18***a*, which is being transported in the direction of arrow M by slide plate **11**, in strictly horizontal position until the very instant that this washer **18***a* may drop downwardly onto the supporting pin **19** of die **6***b*. This is due to the fact that the distance D_1 between the centers of the column of washers **18** in the magazine **9***b* and the center of the supporting pin **19** is smaller than the diameter D_2 of the washer **18***a*.

In order to simplify the illustration, figures in the drawing only show a device for charging one block pattern, which may serve to charge subsequently all block patterns of a block plate. However, it is also possible to combine several such apparatus to a larger plate-like device which may in its entity be placed on a forming plate. The projections **14** of the individual slides may be connected by a suitable rod mechanism or other applicable means, thus enabling all block patterns of a form plate to be simultaneously charged with washers by an actuation from one single spot.

It will be understood that this invention is susceptible to modification in order to adapt it to different usages and conditions and, accordingly, it is desired to comprehend such modifications within this invention as may fall within the scope of the appended claims.

What is claimed is:

1. An apparatus for placing washers onto the washer-supporting pins of rubber heel molds comprising a mold having a heel-shaped mold cavity, a plurality of washer-supporting pins protruding upwardly from the bottom of said mold cavity, an upper and lower plate being

spacedly arranged in parallel relation, a slide plate slidably fitting in the interspace between said upper and lower plate, the thickness of said slide plate being thinner and the spacing between said upper and lower plate being only slightly greater than the thickness of the washers to be handled by the apparatus, said lower plate having passage openings therein coaxially with said supporting pins, said upper plate being provided with openings therein displaced relative to the passage openings in said lower plate, a plurality of washer magazines each of which communicates with one of the openings in said upper plate and carried by the upper plate, said slide plate being provided with holes for receiving washers from said magazines through the openings in the upper plate and for transmitting the washers to said passage openings in the lower plate; said holes in the slide plate being adapted for registration with the openings in the upper plate and, upon displacement of the slide plate between the upper and lower plate, with the corresponding openings in the lower plate; the centers of said magazines and of the openings in the upper plate being displaced from the central axes of the corresponding passages in the lower plate and corresponding supporting pins by a distance smaller than the diameter of the washers, so that the weight of the staple of washers remaining in the magazine presses upon the washer in the hole of the slide plate and prevents tilting thereof until the slide plate hole fully registers with the corresponding opening in the lower plate and the displaced washer can drop therethrough onto the corresponding supporting pin.

2. An apparatus for placing washers onto the washer-supporting pins of rubber heel molds comprising a mold having a heel-shaped mold cavity, a plurality of washer-supporting pins protruding upwardly from the bottom of said mold cavity, an upper and lower plate being spacedly arranged in parallel relation, a slide plate slidably fitting in the interspace between said upper and lower plate, the thickness of said slide plate being thinner and the spacing between said upper and lower plate being only slightly greater than the thickness of the washers to be handled by the apparatus, said lower plate having passage openings therein coaxially with said supporting pins, said upper plate being provided with openings therein displaced relative to the passage openings in said lower plate, a plurality of washer magazines each of which communicates with one of the openings in said upper plate and carried by the upper plate, said slide plate being provided with holes for receiving washers from said magazines through the openings in the upper plate and for transmitting the washers to said passage openings in the lower plate; said holes in the slide plate being adapted for registration with the openings in the upper plate and, upon displacement of the slide plate between the upper and lower plate, with the corresponding openings in the lower plate; said magazines comprising one group displaced in one direction from the holes in the lower plate and the corresponding supporting pins and another group displaced in the opposite direction from the holes in the lower plate and the corresponding supporting pins, so that the washers from a part of said magazines are released into the holes of said slide plate when the slide plate is moved in one direction and the washers from the remaining magazines are released when the slide plate is moved in the other direction, thereby providing a shortened operative space for the slide plate actuating mechanism and uniform accessibility of all marginal portions of the heel in the heel mold.

3. An apparatus according to claim 2 in which the amount of displacements of the centers of the magazines from the central axes of the respective supporting pins is less than the thickness of the washers, so that the weight of the staple of washers remaining in the magazine presses upon the washer in the hole of the slide plate and prevents tilting thereof, until the slide plate hole fully

registers with the opening in the lower plate and the displaced washer can drop therethrough onto the supporting pin.

4. An apparatus according to claim 2 in which the displacements of the washer magazines relative to the hole corresponding thereto are always toward the center of the heel mold.

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