March 22, 1927. 1,622,077

J. J. BATTERMAN

MANUFACTURE OF RUBBER HEELS

Filed Sept. 28, 1922

Fig. 1.

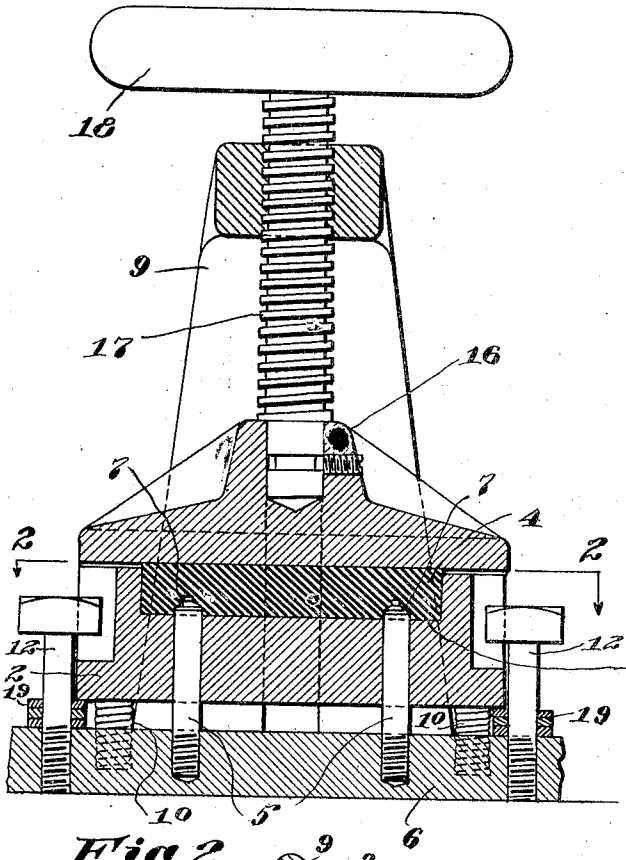


Fig. 3.

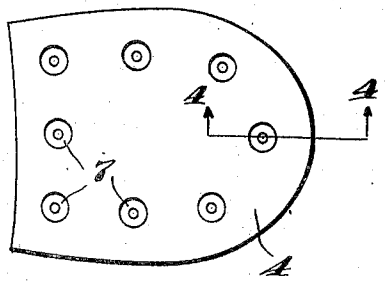


Fig. 4.

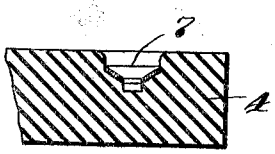
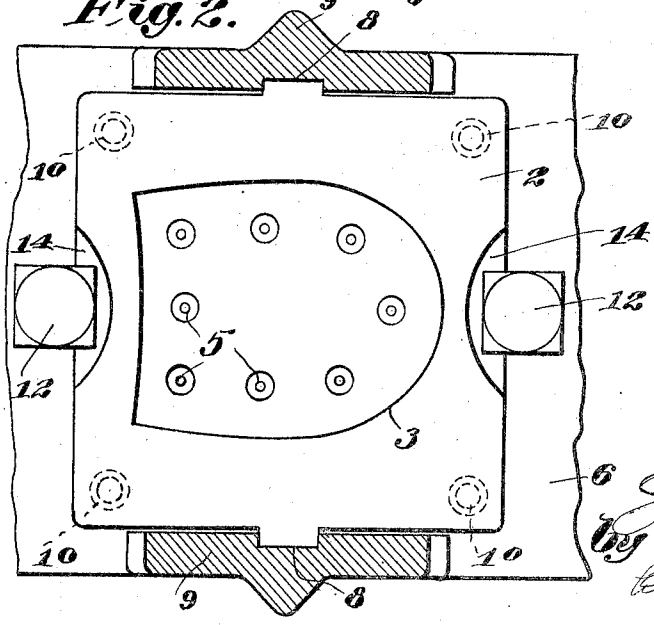


Fig. 2.



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UNITED STATES PATENT OFFICE.

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MANUFACTURE OF RUBBER HEELS.

Application filed September 28, 1922. Serial No. 591,093.

This invention relates to rubber heels and to processes of manufacturing them, and it aims to effect economies in the manufacture of articles of this character.

A rubber heel of the common commercial form has a series of washers embedded in the body thereof, these washers being designed to support the heads of the nail, screws, or other fastenings by means of which the heel is secured to a shoe, and to distribute the strain exerted by the fastenings over a greater part of the body of the heel than otherwise would be the case.

The usual process of manufacturing rubber heels consists in making an unvulcanized rubber heel stock of suitable composition, running this stock into sheets of suitable thickness, and dieing out rubber heel blanks from this stock. These died out pieces, commonly known as blanks or "biscuits", are subsequently molded and vulcanized to form finished heels. The nail receiving washers for each heel are located on posts projecting into the heel cavities of the molds, and a biscuit or unvulcanized heel blank is placed on the posts in each cavity and is pressed into the cavity at the beginning of the molding operation, thus forcing the washers into the body of the blank. The posts hold these washers in the proper relationship to the body of the heel during the molding and vulcanizing operations. It will be observed that according to this process the forcing of the washers into the body of the heel is merely an incident in the molding operation.

For the purpose of performing the molding and vulcanizing operations (usually referred to simply as "molding") it is customary to use molds provided with a large number, say for instance thirty-six (36), heel cavities. The press in which the molding operation is performed has several "decks", usually four. That is, it is constructed to take four molds; and it is customary to run such a machine with two operators, one on each side of the press, each operator handling two molds. The washers are placed on the studs in the mold cavities by the press operators or "molders", and the length of time required for the molding of each individual batch of heels is controlled primarily by the time required for the molder to place the washers on the posts in the molds.

The present invention aims to improve the processes of manufacturing rubber heels with a view particularly to reducing the labor and expense involved in embedding the washers in the heels.

The nature of the invention will be readily understood from the following description when read in connection with the accompanying drawings, and the novel features will be particularly pointed out in the appended claims.

Referring now to the drawings,

Figure 1 is a vertical cross sectional view of an apparatus which may conveniently be used in performing the present process;

Fig. 2 is a horizontal cross sectional view on the line 2—2, of Fig. 1;

Fig. 3 is a plan view of an unvulcanized rubber heel blank loaded with washers, in accordance with this invention; and

Fig. 4 is a cross sectional view on the line 4—4, Fig. 3, on an enlarged scale.

According to the present method the unvulcanized rubber heel blanks may be produced by the customary processes. Such a blank is next loaded with nail receiving washers arranged in substantially the positional relationship which it is desired to have them occupy to each other in the finished heel, and these washers are embedded in the body of the blank in substantially the relationship to the outline of the blank which they will finally occupy. Preferably the washers are all embedded simultaneously in the blank although they may, if desired, be forced into the blank one at a time in the proper positional relationship to the blank and to each other.

For the purpose of performing this part of the process, the apparatus shown in Figs. 1 and 2 of the drawings may conveniently be employed. This apparatus comprises a lower die or mold member 2 having a heel-shaped cavity 3 in the upper surface thereof, this cavity being shaped to fit approximately the outline of the unvulcanized rubber heel blank 4 into which the washers are to be embedded. A series of pins or posts 5, secured fast in the base 6, project through holes formed in the die 2 and are shouldered at their upper ends, each having a central tip

designed to project through the hole in a washer 7 of the ordinary form. The die 2 is mounted to move up and down in ways 8—8 formed in the opposite walls of a yoke 9 which is secured fast to the base 6 and overlies the die, as clearly shown in the drawings. Four springs 10 placed under corners of the die 2 hold it normally in an elevated position, the upward movement of the die by the springs being limited by the heads of bolts 12—12 which are screwed into the base 6, the heads of the bolts lying in recesses 14—14 cut in opposite sides of the die. The bolts 12 thus form stops and they are adjusted so that when the die is in its uppermost position the tips of the washers supporting posts 5 will be level with or just below the inner lower surface of the die.

While the parts are in this position the operator places a washer on the upper end of each post; he then places an unvulcanized rubber heel blank in the cavity 3, and next forces this blank downwardly upon the posts 5. For this purpose pressure is applied to the blank through an upper plate 16, swiveled on the lower end of a screw 17 which is threaded through the yoke 9 and has a hand wheel 18 secured to its upper end. Pressure so applied depresses the die 2 with the blank and thus relatively forces the posts 5 carrying the washers 7 up into the body of the heel blank 4, embedding the washers firmly in the blank. In order to predetermine the depth to which the washers will be embedded a series of washers or collars 19 are located on the bolts 12—12 where they form an adjustable stop limiting the downward movement of the die 2.

When the plate 16 is raised again the springs 10—10 will return the die 2 to its uppermost position, thus lifting the blank 4 off the upper ends of the posts 5 but leaving the washers 7 securely embedded within the blank. The blank is then removed and the operations just described are repeated. Fig. 4 shows approximately the manner in which the stock contracts above the washers and anchors it in the body of the heel.

There are many rubber heel compositions which in their unvulcanized state have such a tough and elastic consistency that it is not feasible to locate washers in them simply by pushing them into the blanks as above described. In such stocks the washers can be forced into the body of the blank without difficulty, but after the washers have been so positioned the stock acts on them in such a way that it tips them up into more or less of an edgewise position, and thus makes it impossible to register these washers subsequently with the posts in the heel mold. On the other hand, many other compositions do not have this peculiar elasticity and toughness but have a more plastic and putty-like consistency; and in such stocks it is entirely practicable to position the washers in the uncured blanks or biscuits as above described, the material of the blank being displaced solely by the act of pressing the washers into the blanks.

This step in the process of manufacturing rubber heels may be performed at any desired period prior to the completion of the heel. The molding and vulcanizing may be performed in an entirely different plant, or by a different concern. Subsequently, however, the heels so loaded with washers will be placed in the heel cavities of suitable molds. The washers in each heel will be registered with the washers supporting pins or posts with which each cavity is provided, and the molding and vulcanizing operations will then be performed in the usual manner.

As the heel blanks are pressed into the mold cavities by the upper plate of the mold, the washers will be forced farther into the body of the blank and will be re-positioned with reference to the stock; or, in other words, the washers and stock will be brought into the proper relationship which it is desired to have them occupy to each other in the finished heel.

The positional relationship of the washers to each other, and with reference to the outline of the heel, will not, however, be substantially disturbed, it being understood, of course, that the washer posts in the cavity have the same relationship to each other that the posts 5 occupy. The washers, therefore, are held in their proper positions while the molding and vulcanizing operations are performed in exactly the same way that they have been held heretofore.

It will now be appreciated that this invention relieves the molder of the duty of placing washers on the posts in the cavities of the heel molds. Instead, this operation is performed before the heel blanks go to the molder. It is obvious that no skill or training is required to locate these washers on the posts and this labor, therefore, can be performed by girls or other unskilled laborers so that the expense of this operation is substantially less than that of having the molders place the washers on the posts in the heel cavities. Furthermore, the girls can handle washers and locate them in an apparatus such as that shown much more rapidly than the molders can handle these devices in the molds, the molder being handicapped by the fact that the molds are very hot. Since he is relieved of this duty, it is simply necessary for him to re-load the heel cavities with heel blanks loaded with washers, the washers being properly spaced to register with the posts or pins in the molds. The molder, therefore, is enabled to handle many more molds than he could otherwise, and the time required for the molding operation can be reduced to that necessary simply

for vulcanization to take place. Since the molder is the highest paid operative connected with the manufacture of rubber heels, and since the presses and molds are the most expensive pieces of equipment used in this industry, the saving effected by increasing the output of the molder will readily be appreciated.

While I have hereinbefore described the process devised by this invention in connection with certain apparatus, it will readily be appreciated that the process is not limited to the use of the specific apparatus disclosed, or with any other special form of apparatus.

The present application is related to my prior application Serial No. 580,021, filed August 7, 1922, for improvements in the manufacture of rubber heels, and said earlier application contains the broad claims covering the subject matter common to the two cases. The claims of the present application are confined to subject matter which cannot be claimed in said earlier application.

Having thus described my invention, what I desire to claim as new is:

1. That improvement in the process of manufacturing a rubber heel having nail receiving washers embedded therein, which consists in arranging the washers in substantially the positional relationship which it is desired to have them bear to each other in the finished heel, forcing the washers so arranged into the body of an unvulcanized rubber heel blank while maintaining said arrangement substantially undisturbed, displacing the material of the blank solely by said act of forcing the washers into the blank, subsequently placing said blank in a heel mold, and performing the molding and vulcanizing operation on the blank while holding said washers in said relationship.

2. That improvement in the process of manufacturing a rubber heel having nail receiving washers embedded therein, which consists in arranging the washers in substantially the positional relationship which it is desired to have them bear to each other in the finished heel, forcing the washers so arranged simultaneously into the body of an unvulcanized rubber heel blank while maintaining said arrangement substantially undisturbed and displacing the material of said blank solely by the act of forcing said washers into said blank, subsequently performing the molding and vulcanizing operations on the blank while holding said washers in said relationship, and, during said molding and vulcanizing operation, repositioning the material of said blank with reference to said washers to bring said material and washers into their permanent relationship.

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