J. H. CURLEY.

HOOF PAD.

APPLICATION FILED DEC. 19, 1911.

1,100,670. Patented June 16, 1914.

Fig. 1.

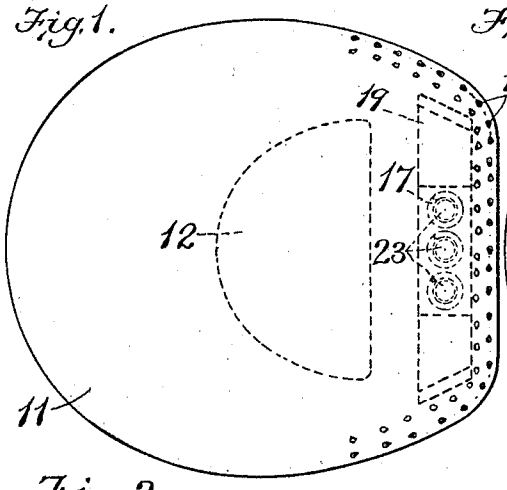


Fig. 3.

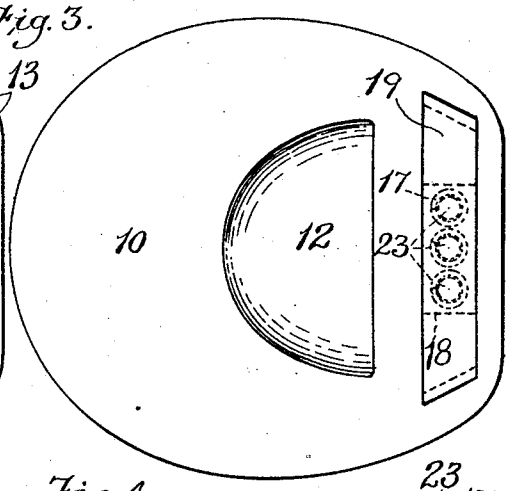


Fig. 2.

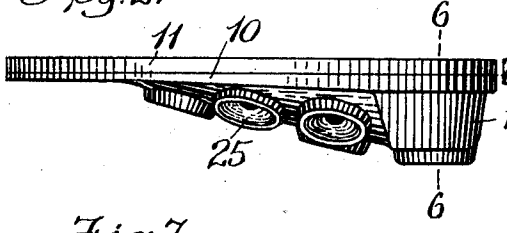


Fig. 4.

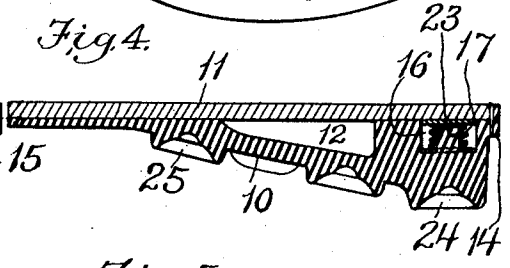


Fig. 7.

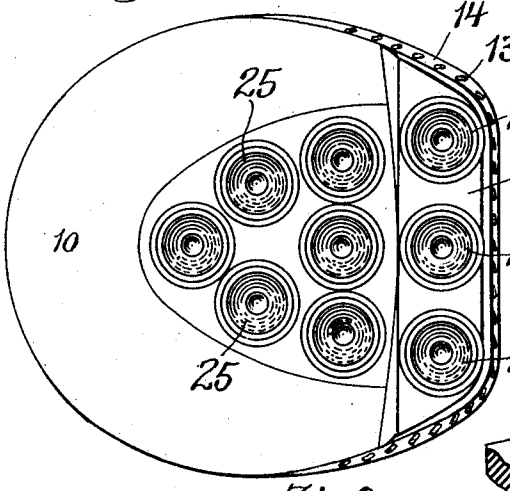


Fig. 5.

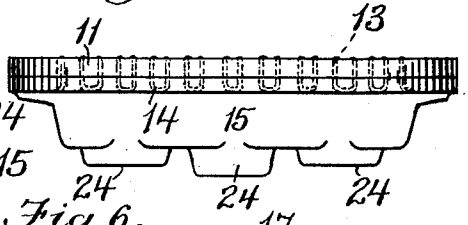


Fig. 6.

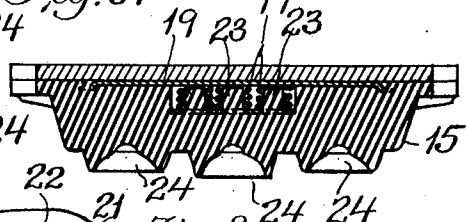


Fig. 8.

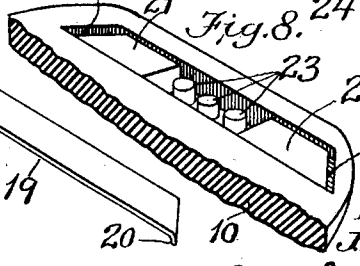


Fig. 9.

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UNITED STATES PATENT OFFICE.

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HOOF-PAD.

1,100,670. Specification of Letters Patent. Patented June 16, 1914.

Application filed December 19, 1911. Serial No. 666,661.

To all whom it may concern:

Be it known that I, JOHN H. CURLEY, a citizen of the United States, and resident of Brockton, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Hoof-Pads, of which the following is a specification.

This invention relates to hoof pads, and embodies in some respects the construction of the hoof pad which forms the subject-matter of my former Patent No. 952,609, issued March 22, 1910.

In the present invention the structure embodies improved features which are not in the hoof pad shown in the aforesaid patent. Referring to the accompanying drawings, which illustrate one form in which the present invention may be embodied: Figure 1 represents a top plan view of a complete pad. Fig. 2 represents a side elevation thereof. Fig. 3 represents a top plan view of the pad without the top layer. Fig. 4 represents a longitudinal vertical section through the middle of the pad. Fig. 5 represents a rear elevation of the pad. Fig. 6 represents a vertical cross section in the plane indicated by line 6—6 of Fig. 2. Fig. 7 represents an inverted plan view. Fig. 8 represents a perspective view of the rear rubber portion of the pad. Fig. 9 represents a perspective view of a metal plate which is adapted to occupy the chamber shown in Fig. 8.

The same reference characters indicate the same parts wherever they occur.

The pad comprises a main body of rubber, indicated at 10, and a top layer 11 of reinforcing material such, for example, as leather. The rubber pad is hollowed out at 12 to form a pneumatic chamber which is closed when the layer 11 is permanently attached. Wire fasteners 13 are used for attaching the marginal portion of the leather layer to the marginal portion of the rubber pad around the rear and sides, in order to securely hold the rubber to the leather at the point where the greatest stress occurs. The rubber pad is formed with a flange or lip 14 for the reception of the fasteners 13. The fasteners, as shown, are in the form of staples and are driven upwardly from the under side of the flange 14 and clenched upon the upper side of the reinforcing layer 11. Separate fasteners are thus employed instead of stitching the rubber and leather together with a continuous strip of wire, because the staples may be more readily inserted. It is not intended, however, to limit the invention in this respect to the particular form of fasteners shown. The contacting surfaces of the rubber and leather are preferably coated with suitable cement in order to prevent the admission of moisture and in order to seal the chamber 12 and make it air tight. In this way a closed pneumatic cushion is provided for the sensitive part of the hoof.

The rubber pad 10 is formed with a relatively deep crossbar 15 at its rear. This crossbar underlies the heel of the hoof and is provided for sustaining and absorbing the shock when the hoof strikes the ground. In the matter of the crossbar, the pad is similar to that shown in my aforesaid patent. This crossbar is formed with a chamber, indicated at 16, in which respect it is similar to the pad shown in the patent hereinbefore mentioned. The chamber is located midway between the sides of the pad, and its function is to relieve the sensitive part of the foot from shocks and from pressure due to compression of the crossbar. For structural reasons it is necessary to provide in the chamber some resilient means for sustaining the load, for without such means the rear part of the pad would spread laterally under the weight imposed upon it and would soon become ruptured and useless. For this reason the crossbar is provided with one or more springs indicated at 17, these springs being arranged in the chambers to assist in sustaining the load and incidentally to assist in preventing excessive distortion of the walls of the chamber. The springs in the form shown are helical, and are seated upon a metal plate 18 by which they are prevented from embedding themselves in and lacerating the rubber. The upper ends of the springs bear against a metal plate or strip 19, one of whose functions is to protect the reinforcing layer 11 from injury by the springs. This plate has another function, namely, that of preventing excessive lateral spreading of the rubber. For this purpose its ends or side edges are bent to form lips or flanges 20. (See Fig. 9). The crossbar 15 is formed with surfaces 21 one on either side of the springs 17. These surfaces serve as seats for the end portions of the plate 19. The lips 20 of the plate are adapted to engage faces or edges 22 of the rubber and thereby prevent excessive spreading of the rubber. The spaces provided for

the reception of the lips 20 are slightly wider than the lips, and permit a very slight lateral spreading of the rubber. This formation tends to ease the action of the lips 20 and prevent them from cutting the rubber.

The greatest pressure upon the pad is exerted upon the faces 21, because these faces are directly under the heel of the hoof, and for this reason it is necessary to provide some means such as the lips 20 to hold the rubber in place; for if the rubber is once ruptured it will soon tear apart and become wholly destroyed.

The springs 17 are preferably of such proportion that it is necessary to compress them slightly in assembling the pad, and they are therefore constantly under compression and better able to sustain the load. Instead of making them too stiff and strong, I prefer to make them comparatively light and to provide auxiliary means adapted to assist them in sustaining the load when they are compressed to a greater degree than that shown. For this purpose I form the crossbar 15 with portions 23 in the form of studs over which the springs are adapted to be placed. The metal plate 18 is formed with holes through which the studs 23 extend. The studs extend upwardly, nearly but not quite to the level of the faces 21, and are normally separated from the plate 19 by a shallow space, as shown by Figs. 4 and 6. These studs are adapted to be moved into engagement with the plate 19 when the crossbar is compressed vertically, and when so moved they are subject to compression and in this way their resilience is available to assist in sustaining the load. It is obvious that the studs are adapted to hold the springs in place, in addition to serving as means for sustaining the load. When the pad is applied to a horse of relatively light weight, the studs 23 may be sufficient without the springs, or the springs may be sufficient without the studs. It is obvious that either form of resilient means may be used without the other and that they readily adapt themselves to each other for combined use. For an exceedingly light horse it may be advantageous to omit both the springs and the studs and to use the plate 19 with or without the chamber 16.

The tread portion of the crossbar is formed with suction cups or chambers 24. In the form shown there is one such cup in the middle and one on either side. The rim of the middle cup extends below the horizontal plane of the rims of the side cups, thus presenting the equivalent of a convex tread surface. The cups are formed in this manner for the purpose of avoiding a sudden rocking of the hoof when it strikes the ground in case the hoof is not squarely trimmed preparatory to attaching the pad. However the hoof may be trimmed, the solid bodies of rubber between the side cups and the bearing surfaces 21 sustain the greater part of the load because of the provision of the chamber 16 which causes some of the load to be diverted from the middle of the crossbar toward the sides. The pad is provided with additional suction cups 25 in front of the crossbar 15. These cups are under the pneumatic chamber 12. When the pad is attached to a hoof, the relatively thin forward part lies between the bottom of the hoof and the usual shoe. The nails which are used to attach the shoe pass through the members 10 and 11 of the pad and fasten the latter in place.

Having thus explained the nature of my said invention and described a way of constructing and using the same, although without attempting to set forth all the forms in which it may be made or all the modes of its use, what I claim is:

1. A hoof pad comprising a rubber pad member formed with a crossbar on its under side at the heel, and a chamber in said crossbar extending to the upper surface thereof, and a metal plate arranged in said chamber, said crossbar having means at each side for supporting said plate so that the upper face of the plate is flush with the upper face of the crossbar, said chamber providing a space between said supporting means, said plate having downwardly extending portions near the sides of the pad, and said crossbar having shoulders adapted to engage the inner sides of said downwardly extending portions to prevent lateral spreading of the rubber.

2. A hoof pad comprising a rubber pad member having a crossbar on its under side at the heel, and a chamber in said crossbar extending to the upper face thereof, detachable means forming a top wall of said chamber, detachable resilient load-sustaining means in said chamber and an auxiliary load-sustaining member in said chamber, the depth of said auxiliary member being less than the normal depth of the chamber whereby vertical contraction of the chamber is necessary to effect the load-sustaining action of said auxiliary member.

3. A hoof pad comprising a rubber pad member formed with a crossbar on its under side at the heel, a chamber in said crossbar, and a stud-shaped portion extending upwardly from the bottom of the chamber; a perforated wear-resisting plate seated upon the bottom of said chamber and surrounding said stud-shaped portion, a wear-resisting plate extending across the top of the chamber, a helical spring surrounding said stud between said plates for transmitting pressure from one plate to the other, and a layer of protective covering on the upper side of the rubber pad member and inclosing the upper plate.

4. A hoof pad comprising a rubber pad member formed with a crossbar on its under side at the heel, a chamber in said crossbar extending to the upper face thereof, and a stud-shaped member extending upwardly from the bottom of the chamber, a metal plate extending across said chamber, said crossbar having portions, one at each side of the pad, for supporting said plate, a perforated metal plate against the bottom of said chamber and surrounding said stud-shaped member, and a helical spring surrounding said stud-shaped member and adapted to transmit pressure from one of said plates to the other, the upper end of said stud-shaped member being adapted to engage the upper plate when the crossbar is compressed vertically.

5. A hoof pad comprising a rubber pad member having a cavity open at the top, a metal plate extending across the top of said cavity and bearing upon the top of said pad member at opposite sides of said cavity, said plate having anchoring means extending downwardly into said pad member at opposite sides of said cavity between the rim of said cavity and the margin of said pad member to prevent spreading of the pad member, the top of said pad member extending beyond the extremities of said plate to provide a fastener-receiving portion, and a layer of suitable material covering said plate and secured to said pad member by fasteners disposed in said fastener-receiving portion.

In testimony whereof I have affixed my signature, in presence of two witnesses.

JOHN H. CURLEY.

Witnesses:
W. P. ABELL,
P. W. PEZZETTI.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."