April 4, 1950 F. G. CLARK 2,502,929

CUSHIONING ROLLER UNIT

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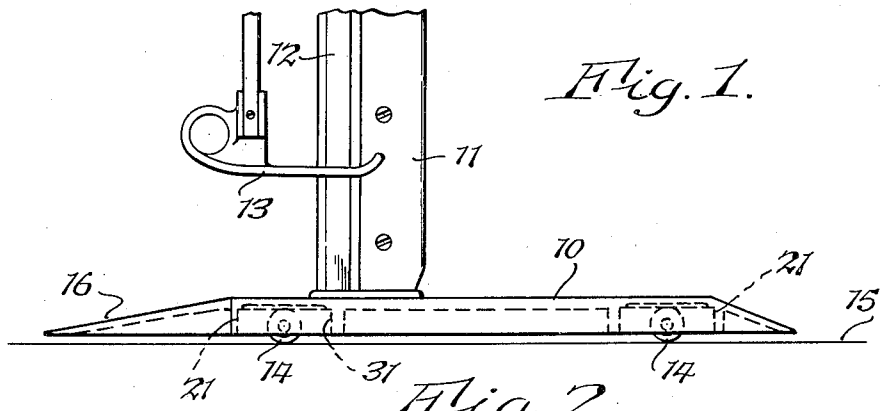
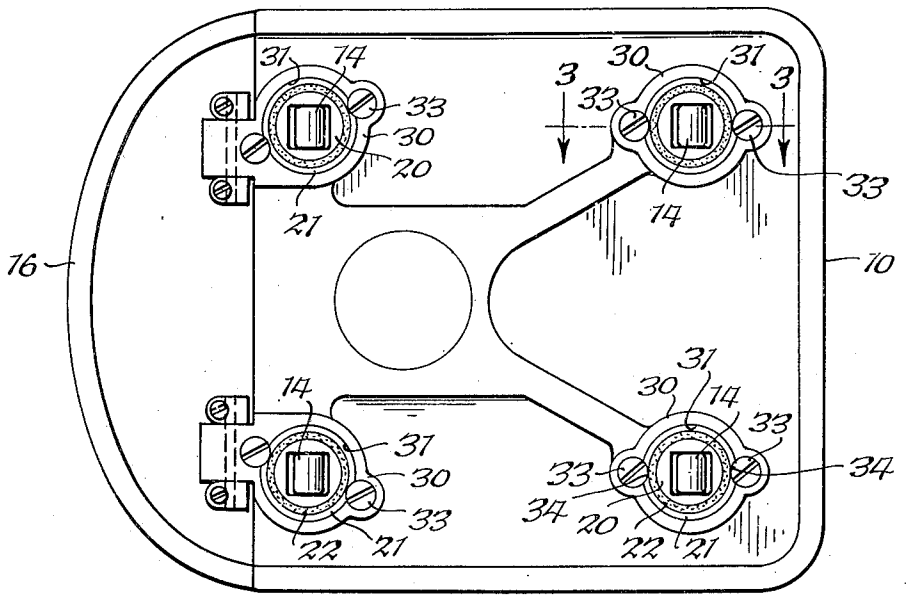


Fig. 1.

Fig. 2.



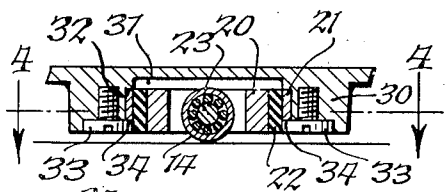


Fig. 3.

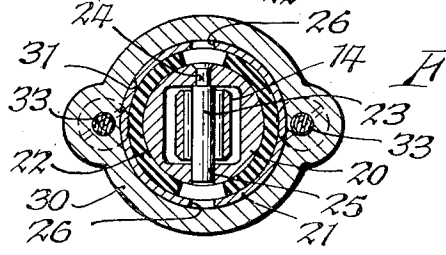
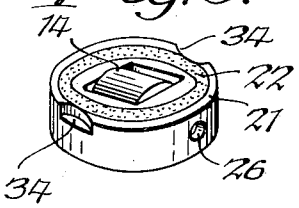


Fig. 4.

Fig. 5.



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CUSHIONING ROLLER UNIT

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8 Claims. (Cl. 16—44)

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This invention relates particularly to improved cushioning means for the supporting rollers of cutting machines of the type, commonly used for cutting cloth and other sheet materials, which have a knife that is caused to follow the desired line of cut in a lay of material by appropriately moving the machine manually about on the table or surface supporting the material being cut.

Such machines ordinarily comprise a base that rests and is movable on the supporting surface beneath the material being cut, and a slender standard rising vertically from the base and supporting the driving motor or mechanism for the knife. The usual base is of broad shallow form to adapt it to properly support the machine and move beneath the pile or lay of material being cut, and is equipped with supporting rollers to facilitate the movement and manipulation of the machine in use. In some machines of this type, these supporting rollers have been spring-mounted on the underside of the base by means of flat metal springs for the purpose of reducing vibration, shock and noise in the operation of the machines, and while such spring mountings provide a sort of cushioning support for the machine and to some extent reduce the noise and shock in its operation, the springs have a rebounding action and do not efficiently prevent vibration of the machine and shock or strain on the operator who manipulates the machine.

A primary purpose of this invention is to provide an efficient cushioning means or mounting for the supporting rollers of such machines which will overcome the objections to such previous spring mountings and effectually eliminate or absorb objectionable vibration and shock in the operation of the machines and prevent the strain incident thereto on the operators of the machines.

Other objects of the invention are to provide a practical and desirable cushioning supporting means for such machines which is of simple and economical construction; in which the cushioning action is effected by means of a body or bodies of rubber or analogous elastic material disposed so as to be highly efficient in preventing or absorbing vibration, noise and shock in the operation of the machine; which provides a separate or detached, complete cushioned roller unit capable of being quickly and easily installed in place on a machine base; which is of a simple construction adapted to be economically produced as a separate cushioned roller unit suitable for ready installation on the usual shallow machine base, and which separate unit can be quickly and easily

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fixed securely in proper position on the base by ordinary fastening screws.

Further objects and advantages of the invention will appear from the following specification of the preferred embodiment of the invention shown in the accompanying drawings, and the novel features of the invention are set forth in the appended claims.

In said drawings:

Fig. 1 is a side elevation of the lower portion of a cutting machine equipped with cushioning means embodying the invention for its supporting rollers.

Fig. 2 is a bottom plan view of the base.

Fig. 3 is a fragmentary, sectional elevation of the base on line 3—3, Fig. 2, showing one of the cushioning roller units.

Fig. 4 is a sectional plan view thereof on line 4—4, Fig. 3.

Fig. 5 is a perspective view of one of the cushioning roller units detached.

Referring to Fig. 1, which shows by way of example one type of machine to which the improvements embodying this invention may be applied, 10 represents the base, 11 the upright standard fixed to and rising from the base, 12 the reciprocating knife and 13 the presser foot of a cutting machine of known type for cloth or other material. The base, as usual, is of broad, shallow form provided with bevelled or reduced bounding edges or margins.

14 represents the machine supporting rollers, of which four are shown, mounted on the base so as to project slightly below its bottom to roll freely upon the supporting surface 15 for the machine. The base, except as later described, may be of usual construction having, a bevelled front piece 16 hinged or spring-connected to the base to adapt its front edge to bear yieldingly against and slide upon the supporting surface 15. The supporting rollers 14 are suitably located to provide a stable support for the machine, and each roller is mounted on the underside of the base by means of a cushioning unit which comprises two members arranged one within and spaced from the other in horizontal plan, with rubber or analogous elastic material disposed in the space between the members about the inner member and vulcanized or attached to the members, so as to resiliently support one member from the other to yield in a vertical direction, the roller 14 being journalled on or rotatably carried by said one member so as to be resiliently mounted thereby from said other member, which is fixedly secured on the machine base.

Preferably the cushioning unit comprises inner and outer annular members 20 and 21 arranged one concentrically within and spaced from the other in horizontal plan, and the rubber or analogous elastic cushioning material 22 occupies the annular space between the members and is vulcanized or attached fixedly to the opposing surfaces of the inner and outer members. This elastic material may be ordinary or synthetic rubber or other suitable analogous elastic material, and may be in the form of a single annular body or segmental annular sections in the annular space between the members 20 and 21. The outer member is secured stationarily in place on the underside of the base 10 and the inner member, in which the supporting roller 14 is journalled, is thus resiliently supported from the outer member so as to be capable of slight vertical yielding movement relative to the outer member due to the elasticity of the material 22. As shown, the outer member is in the form of a narrow circular ring or band and the inner member has a circular exterior periphery and a central, vertical, rectangular opening in which the roller 14 is journalled by an axle 23 passing axially through the roller with its opposite ends held in diametrically opposite holes 24, 25 in the inner member 20. Antifriction bearing rollers preferably surround the axle within the roller 4. The roller axle 23 may have one end reduced and fitting in its receiving hole 24 in the inner member 20 and securely fastened therein by upsetting or riveting the outer extremity of the reduced end of the axle.

In producing this cushioning unit, its inner and outer members 20 and 21 may be placed in a suitable mold with the crude or raw elastic material in the annular space between the inner and outer members so as to be molded therein and vulcanized or permanently attached to the inner and outer members, before the holes are made in the inner member to receive the roller axle. Then, after the molding and vulcanization of the body or bodies of elastic material between the two unit members, diametrically opposite holes 26 are drilled through the outer member 21 and the holes for the axle 23 drilled in the inner member. The axle 23 is then inserted through one of the holes 26 in the outer member and through the adjacent hole of the inner member, and the registering axle hole of the roller 14 with the reduced end of the axle inserted into the opposite hole 24 in the inner member. The riveting or securing of the axle in place in the inner member can be effected by means of suitable tools inserted in the holes in the outer unit member.

For securing this roller mounting and cushioning unit in place on the machine base, the base is preferably provided in a boss or thick part 30 on its underside with a circular, vertical socket 31 for each unit, in which the outer member of the unit is adapted to be inserted and fit snugly, with the top edge of the other unit member engaging an annular shoulder 32 in the socket so that the supporting roller 14, when the unit is in place, will be held out of contact with the inner end of the socket 31. The cushioning unit fits snugly in the socket and is securely fastened in place therein, preferably by two screws 33, which are screwed into threaded holes in the base at opposite sides of the socket 31, with the heads of the screws projecting into depressions or notches 34 formed in the bottom edge portion

of the outer unit member 21. Thus, to stationarily and securely fasten each cushioning unit in proper position on the base, it is only necessary to insert the unit in its receiving socket 31 and screw the fastening screws into their holes in the base with the screw heads projecting into the peripheral recesses in the outer unit member, and force the unit into the socket 31 until the outer unit member is firmly seated against the shoulder 32 of the socket, by tightening the fastening screws.

In the cushioning means or unit constructed as herein disclosed, the elastic rubber or the like material acts in shear to permit slight and practically imperceptible, vertical, yielding or resilient movement of the machine-supporting roller relatively to the machine base, which action, however, results in cushioning or absorbing vibration and shocks and reducing noise in the operation of the machine without noticeable rebounding spring motion of the machine. The action is such as to practically eliminate shock or strain on the hand or arm of the operator of the machine and prevent bouncing, jumping or chattering of the machine on the machine-supporting surface. The unit is of simple and economical construction and of a form adapting its ready installation and use on bases of the usual shallow form employed on cutting machines of the vertically reciprocating knife type.

I claim:

1. A supporting unit for a portable cutting machine having a base adapted to be moved about on a supporting surface said unit comprising inner and outer annular members arranged concentrically one within and spaced from the other in horizontal plan, and elastic rubber-like material disposed around the inner member in the annular space between said members, said elastic material connecting the members and resiliently supporting the inner member from the outer member, said outer member being fixed on said base, and a roller arranged partly within and rotatably mounted on the inner member to rotate about a substantially horizontal axis and resiliently supported thereby from the outer member.

2. A supporting unit for a portable cutting machine mounted on a base adapted to be moved about on a supporting surface and having a socket formed in the lower surface of said base, said unit comprising inner and outer annular members disposed concentrically one within and spaced from the other in horizontal plan, and elastic rubber-like material disposed in the annular space between said members about the inner member and connecting said members and resiliently supporting the inner member from the outer member to yield vertically relatively to the latter, and a supporting roller arranged partly within and journalled on said inner member, and means for attaching said outer member to said base in said socket therein.

3. In a portable cutting machine having a base adapted to be moved about on a supporting surface, that improvement comprising an inner member, an outer member extending about said inner member and spaced therefrom horizontally, and elastic rubber-like material disposed in the space between said members, said elastic material connecting said members and resiliently supporting one member from the other to yield vertically relatively to said other member, and one of said members being fixed on said base, a supporting roller arranged partly within and rotatably

mounted centrally on said other member, an axle on which said roller is rotatably mounted and the opposite ends of which are secured to said other member, whereby said machine is resiliently supported from said roller through the medium of said elastic material and said elastic material is subjected to shear only when supporting the weight of said machine.

4. In a portable cutting machine having a base adapted to be moved about on a supporting surface, that improvement which comprises an inner member, an outer member extending completely about said inner member and spaced therefrom horizontally, and elastic rubber-like material disposed in the space between said members and secured thereto, said elastic material connecting said members and resiliently supporting the inner member to yield vertically relatively to the outer member, said outer member being fixed on said base, and a supporting roller rotatably mounted centrally on the inner member and an axle for said roller having the opposite ends thereof arranged in apertures in said inner member, said elastic material being subjected to shear only while supporting the weight of said machine.

5. A cushioning roller unit for the base of a cutting machine, including an outer member formed to be secured to said base, an inner member arranged in spaced relation within said outer member and to said base, an elastic rubber-like material disposed in the space between said members, and secured to both of said members, a roller arranged partly within said inner member, and an axle for said roller extending crosswise of said inner member and having its ends supported on said inner member.

6. A cushioning roller unit for the base of a cutting machine, including an outer annular member formed to be secured to the underface of said base, an inner annular member arranged within and spaced from said outer member and said base, an elastic rubber-like material disposed in the space between said members and secured thereto, a roller mounted in said inner member and extending beyond the lower edge thereof, and an axle on which said roller is mounted and which extends substantially at a right angle to the axes of said inner and outer members, the

outer ends of said axle being supported on said inner member.

7. A cushioning roller according to claim 6, in which said inner annular member is provided with apertures into which the ends of the axle extend, and in which said outer member is provided with apertures in alinement with the apertures of said inner annular member to permit the axle to be inserted through an aperture of said outer member through said roller and into position in which the ends of the axle are supported by said inner member.

8. In a portable cutting machine having a base adapted to be moved about a supporting surface, that improvement in which said base is provided with a socket therein extending upwardly from the lower surface thereof, said socket being provided with a peripheral wall having an outwardly facing shoulder formed in spaced relation to the bottom of the socket, a cushioning roller unit formed to be seated in said socket and including inner and outer annular member spaced from each other, an elastic rubber-like material disposed in the space between said members and secured to both members, a roller arranged mainly within said inner member and extending below the lower surface thereof, and an axle for said roller extending crosswise of said inner member and having the ends thereof secured to said inner member, said outer member being arranged in said socket in engagement with said shoulder, whereby said inner member and said rubber-like material are disposed in spaced relation to the bottom of said socket.

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