Jan. 24, 1928. 1,657,059

M. H. BALLARD

PRESS

Filed Aug. 25, 1924

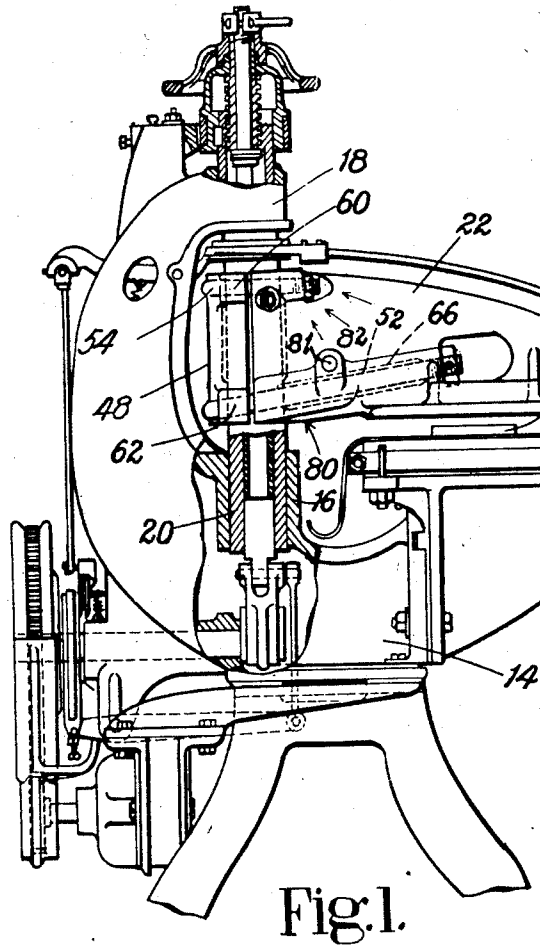


Fig. 1.

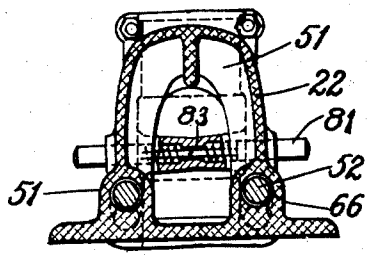


Fig. 3.

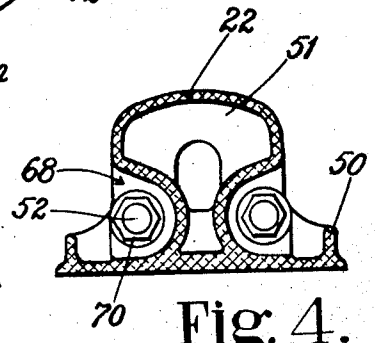


Fig. 4.

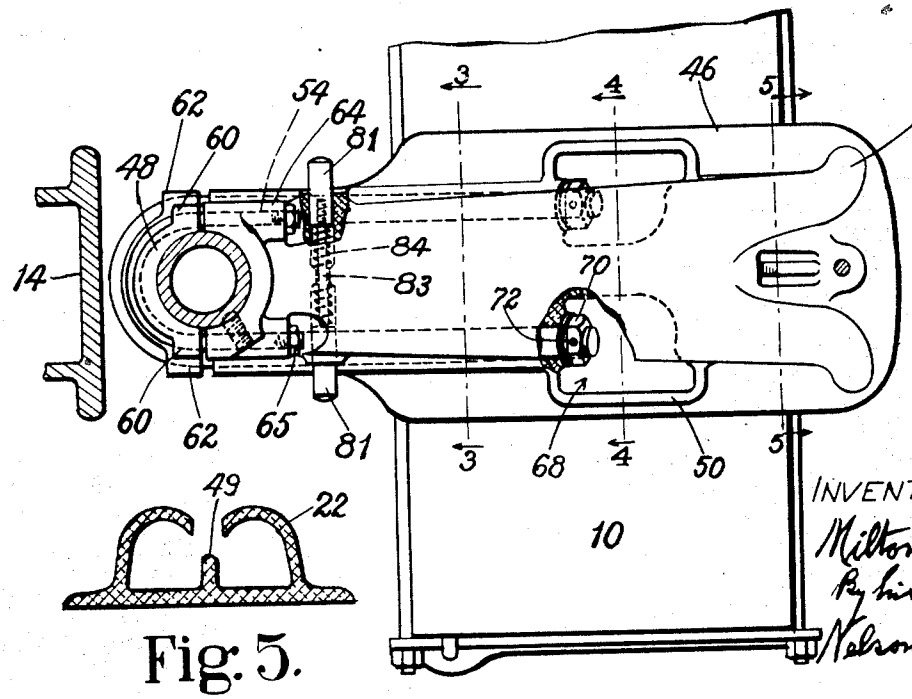


Fig. 2.

Fig. 5.

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UNITED STATES PATENT OFFICE.

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PRESS.

Application filed August 25, 1924, Serial No. 734,033, and in Switzerland August 5, 1924.

This invention relates to presses of the type in which two presser members are relatively movable toward and from each other for the purpose of operating on work supported on one of the presser members, and are also relatively movable in lateral directions so as to operate upon different portions of the work selectively at the will of the operator.

A well-known machine of this type, commonly referred to as a clicking machine, is disclosed in United States Letters Patent No. 921,503, granted May 11, 1909 on an application of Arthur Bates. Such a clicking machine comprises a cutting block of an area designed to support skins such as are used for shoe upper leather and fabrics of considerable widths and a presser member having a pressure applying face of an area considerably less than that of the cutting block and mounted for movement in lateral directions above the cutting block. In operating with such a machine a piece of shoe upper leather or other sheet material is spread upon the cutting block while the presser member is positioned laterally at one side of the block so that there is no obstruction above the cutting block to restrict the amount of light reaching the work or to interfere with proper arrangement and inspection of the work or with the positioning of a freely movable die in any desired location upon the work. After the die has been placed in selected position the presser member is swung into position over the die and starting mechanism is operated to cause a pressure applying movement of the presser member by which the die is forced through the work. Subsequently the presser member is returned to one side of the block to facilitate removal of the die and of the cut blank and the positioning of the same or of another die upon the work.

As presser members for clicking machines have heretofore been made, each has been a single casting with a cylindrical hole near one end for the reception of the clicking machine post which supports and supplies power to the presser member. This hole in the presser member must fit the post accurately so that the presser member may be rigidly secured to the post to prevent relative movement of the post and the presser member during pressure applying operations. In assembling such a presser member with the rest of the machine the presser member is placed with said hole in alinement with the upper and lower bearings for the post. The post is then lowered through the upper bearing in the frame of the machine, through the opening in the presser member, into the lower bearing. If the opening in the presser member is slightly under size great difficulty is encountered in forcing the post through the hole in the presser member. In any case it takes the combined efforts of at least three men to place even a properly fitting presser member in proper relation to the other parts of the clicking machine, the difficulty being aggravated if for any reason the hole in the presser member is even slightly under size. Under these circumstances it may be impossible to assemble the post and a given presser member and it is sometimes even more difficult to remove such a presser member.

It is accordingly an object of the present invention to provide a clicking machine organization which will greatly facilitate the assembling of the presser member and the post and the removal of the presser member from the machine. To this end, an important feature of the invention comprises the provision of a member, illustrated as a cap, co-operating with but separable from the main portion or arm of the presser member, and clamping means, such as U-shaped bolts to secure the two parts together in proper relation to the post of the machine. With this construction the presser member may be secured to or removed from the post without removing the post from its bearings in the frame of the machine. This permits the ready assembling of the presser member and the post of the machine and so facilitates that operation that it may be performed without difficulty by one man instead of, as heretofore, requiring the efforts of three or more.

Moreover, the construction and arrangement above described require no such careful and costly accuracy in reaming the surfaces of the post engaging opening in the presser member as heretofore has been necessary. In fact, upon tightening up the clamp members which engage the cap and the body of the presser member, the vertical

inside edge portions of the cap and of the presser member, if slightly under size, will grip the post and serve to secure the parts even more rigidly than would be the case if the openings or grooves were full or over size.

A further advantage of the illustrative construction lies in the fact that the clamping of the cap and arm of the presser member to the post results in a stiffening of the post itself, the cap and arm acting in a manner analogous to that of splints. This also reduces vibration and its attendant disadvantages.

It is a further object of applicant's invention to stiffen and strengthen the presser members of clicking machines. Accordingly, the presser member of the illustrated machine is chambered and is provided with a reinforcing member of high tensile strength within the chamber and arranged to resist stresses tending to bend or break the presser member. The pressure applied by clicking machines is at times as much as eighteen or twenty tons, and since the presser member in the illustrative type of machine is supported at one end only it will be seen that the presser member is subjected to very hard usage.

In the illustrated construction the U-shaped bolts which are used to secure the cap and the arm of the presser member to the post of the machine themselves serve also as reinforcements for the presser member. As illustrated two of these reinforcing members are used, the lower one of which tends to resist strains developed particularly when the outer end of the presser member strikes a die upon the cutting block. In order to augment the reinforcing effect, this reinforcing member is inclined relatively to the surface of the presser member so that it is effective as a reinforcement from the very start of any deformation of the presser member. On the other hand, when a clicking machine is operated with a die upon the portion of the cutting block near the post the outer end of the presser member tends to continue its downward movement after the presser member strikes the die. This tends to rupture the presser member, from its upper surface downwardly, closely adjacent to the post. The upper attaching member serves as a reinforcement against this kind of breakage. Not only are these reinforcing members useful in preventing breakage of the presser member, but they also add greatly to its stiffness, thus further tending to reduce vibration of the machine and facilitating a nice adjustment of the stroke of the presser member.

As exemplified in a preferred construction herein illustrated, the invention also comprises a clicking machine organization the presser member of which has an arm composed of metal of relatively low density as compared with the density of iron and provided with internal reinforcing means of a different metal of high tensile strength. The illustrated presser member has an aluminum alloy arm having a high aluminum content, such as is disclosed in application Serial No. 730,461, filed August 6, 1924 in the name of Patrick J. Horgan and assigned to the assignee of this application. The illustrated reinforcing members do not interfere with the ease of swinging of the presser member laterally over the cutting block. Thus such a clicking machine organization retains all the advantages which have made the clicking machine set forth in said application conspicuously successful. At the same time, the presser member of the clicking machine herein set forth is even more rigid than a cast iron presser member of like dimensions.

Another feature of the invention relates to the provision of mechanism for lessening the shock of the blow when the presser member, upon being swung in either direction, comes into contact with the frame of the machine, and for returning the presser member toward the operator. To this end, the illustrated presser member is provided with spring-pressed plungers mounted on opposite sides of the member.

With the above objects and features in view, the invention will now be described with reference to the accompanying drawings and pointed out in the claims.

In the drawings,

Fig. 1 is a view in side elevation and partly in section of a clicking machine illustrating one embodiment of the invention;

Fig. 2 is a plan view partly in section and showing the presser member and the cutting block as viewed from above;

Fig. 3 is a sectional view of the presser member taken along the line 3—3 of Fig. 2;

Fig. 4 is another section of the presser member along the line 4—4 of Fig. 2; and

Fig. 5 is still another section of the presser member along line 5—5 of Fig. 2.

The invention is herein disclosed as embodied in a clicking machine of the type illustrated in said United States Letters Patent No. 921,503, to which reference may be had for a more detailed description of the machine as a whole. Accordingly, the illustrated machine is provided with a cutting block 10 supported upon a bracket 12 secured rigidly to the frame 14 of the machine. Mounted in bearings 16 and 18 provided in the machine frame 14 is a post 20 rotatable in the bearings so that a presser member 22 which is secured to the post may be swung laterally over the cutting block 10.

Power means such as are shown in United States Letters Patent No. 1,431,920, granted October 17, 1922, upon an application filed

in the name of Milton H. Ballard, are provided for reciprocating the post 20 vertically in its bearings 16 and 18 whereby the presser member 22 is caused to force a die, indicated at 24, through material M resting upon the cutting block 10. A handle 30 is provided on the presser member for controlling the reciprocation of the presser member and the post as disclosed in said United States Letters Patent No. 921,503.

In order to facilitate the assembling of the machine and the removal of the presser member 22 when necessary, the presser member comprises an arm 46 extending over the cutting block 10 and a cap 48, provided with complemental concave surfaces adapted to fit and be clamped upon the cylindrical surface of the post in opposition to each other (Fig. 2). Cap 48 is provided with a groove and a pair of perforated ears 60 adjacent to the top edge thereof for the reception of a clamping member 54 and with a similar groove and ears 62 adjacent to the lower end thereof to receive a clamping member 52.

Clamping members 52 and 54 are illustrated as U-bolts with their parallel arms received in chambers formed in arm 46 of the presser member. The upper clamping member 54 passes through perforated ears 64 on each side of the arm 46 of the presser member and nuts 65 are provided for tightening up the clamping member, thereby rigidly securing cap 48 to the arm 46 of the presser member and both to the post 20. Preferably, and as shown, the presser member is hollow and is provided with chambers 66 formed in the side portions of the arm 46 to receive the parallel arms of the clamping member 52. At the ends of the passageways 66 are recesses 68 in the sides of the presser member 22 to give free access to the ends of the clamping member 52 so that nuts 70 may be readily manipulated to secure the parts together or to release them as occasion may require.

In the assembling of the presser member with the post and with the cap member 48 the presser member 22 is supported on the cutting block 10 over one corner thereof. Then the cap 48 is placed in position and the parts manipulated so that the arms of the clamping member 54 may be passed through the passageways designed to receive them. After the nuts have been threaded part way on clamping member 54, the presser member 22 may be swung further to one side so that the clamping member 52 may be readily introduced and the parts rigidly secured by tightening the nuts. Preferably, and as shown, the nuts 70 are securely fixed against turning movement by means of set screws 72 which have hardened ends adapted to bite into the screw threads on the ends of the clamping member 52.

Since the pressure exerted by the presser member during the pressure applying operation, when the machine is operated upon heavy work, may be as much as eighteen or twenty tons, the reinforcing effect of the clamping member 52, which is a tension member, and therefore is well adapted to sustain severe stresses, is of great value particularly if the presser member is composed of a light aluminum alloy as set forth in said application Serial No. 730,461, filed in the name of Patrick J. Horgan. That application discloses clicking machines having presser members composed of alloys in accordance with the following formulæ:

(*a*) 94% aluminum; 4% copper; 1% nickel; .5% manganese; and .5% magnesia.

(*b*) 89.05% aluminum; 7% zinc; 2.75% copper; 1.2% iron.

The presence of a reinforcing member such as member 52 not only markedly increases the ultimate strength of the presser member of a clicking machine under the stresses to which it is subjected, but also stiffens it greatly making a light aluminum alloy presser member much stiffer even than the old cast iron presser member which has been in use for many years.

It may be noted that in the operation of the machine, particularly with the die near the outer end of the presser member, stresses are sometimes set up in a direction tending to bend or break the presser member at or adjacent to the point 80 (Fig. 1) at the same time tending to compress the material of the presser member along the lines indicated by the arrows 82. Accordingly, and in order to reinforce the presser member against such stresses, the clamping member 52 is also made of steel having a high tensile strength.

As shown, in order to increase the reinforcing and stiffening effect of the member 52 that member is inclined a few degrees with respect to the pressure applying surface of the presser arm; thus it is rendered effective as a reinforcing and stiffening member from the very beginning of any distortion of the presser member which may take place.

In order still further to strengthen the hollow presser member, it is provided with flanges and ribs as shown at 49, 50 and 51.

Preferably, and as shown, the presser member is provided with means for lessening the shock of the blow when it comes into contact with the frame upon being swung in either direction away from over the cutting block 10. In the illustrated construction, this means comprises a spring-pressed plunger 81 mounted in a socket in the side of the presser member 22. Since it is desirable to have a buffer member on each side of the presser member, two plungers 81 are conveniently mounted as one mem-

ber through a connecting rod 83 which has screw-threaded ends receivable in interiorly screw-threaded sockets in the plungers 81. As shown, the middle part of the connecting rod 83 passes through an opening much restricted in size when compared with the sockets that receive the plungers 81, the purpose being to provide a shoulder at each side of the restricted part of the opening so that springs 84 may have each a backing wall or seat while the other end of each spring engages an adjacent surface on its corresponding plunger 81. Hence, inward movement of either plunger 81 is resisted by a spring 84 seated in the plunger socket. The described construction provides plungers and springs which may be easily assembled or disassembled as occasion may require. Preferably the springs 84 are of considerable size and strength so that when the presser member is swung away from over the front of the cutting block with such force as to cause either plunger to engage with the frame of the machine there will be a rebound of the presser member due to the action of the spring behind the plunger. By reason of the provision of such a buffer mechanism as that shown the operator may throw the presser member to one side without attention as to the force employed since no damage will be done to either frame or presser member. Moreover, he is certain to have the presser member returned to him part way through the operation of one of the spring-pressed plungers, provided that more than a certain minimum force is employed in swinging the presser member to one side following a pressure applying operation.

The illustrated presser member is sufficiently rigid to give practically the same results all over the surface of the cutting block 10 wherever the die may be selectively positioned by the operator. In other words, the presser member possesses sufficient rigidity to ensure that the die will be forced through the work whether it be located at the rear of the cutting block and thus near to the post or whether it be out near the free end of the presser member. Moreover, the inclusion of the steel reinforcing members in the construction of the presser member makes no noticeable addition to the effort required in swinging the light presser member of said application Serial No. 730,461 laterally above the cutting block. This is true not only because of the small weight of members 52 and 54 but also because of the fact that all of the upper reinforcing member 54 is disposed so as to have its parts closely adjacent to the post 20, and with respect to the lower reinforcing member 52, certainly a good third of its total weight is disposed so as to be closely adjacent to the post. Moreover, the weight of the securing members 52 and 54 is small as compared with the weight of the presser member. Consequently, the reinforced presser member is found to swing with such little effort that the operator's efficiency is increased markedly when comparison is made with the old type clicking machine provided with the heavy cast iron presser member and the advantages of the light swinging presser member disclosed in the above mentioned application Serial No. 730,461 are retained.

Having described the invention, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. A clicking machine having a cutting block, a post, a presser member comprising an arm extending over the cutting block, a cap, and means securing the cap and the arm of the presser member to the post, said presser member being movable toward and from the block in pressure applying operations and laterally over the block.

2. A clicking machine having a cutting block, a rotatably mounted post, a presser member comprising an arm extending over the cutting block and movable with the post in lateral directions over the block, a cap engaging the post and the arm of the presser member, and means for clamping the cap and the arm of the presser member to the post.

3. A clicking machine having a cutting block, a post, a presser member comprising an arm extending over the block, a cap engaging the post and the arm of the presser member, and means securing the cap and the arm of the presser member rigidly to the post, said post being reciprocable to carry the presser member toward and from the block in pressure applying operations and rotatable to permit movement of the presser member over the cutting block.

4. A clicking machine having a cutting block, a post, a presser member comprising an arm extending over the cutting block, a cap, and means for attaching the cap to the arm of the presser member thereby securing the presser member to the post.

5. A presser member for clicking machines comprising an arm, a cap separable from the arm, the arm and cap being formed for the reception between them of a supporting means for the presser member, and means adapted to secure the cap rigidly to the arm.

6. A presser member comprising an arm, a cap separable from the arm, and a member adapted to engage the cap and the arm to secure the presser member rigidly to the post of a clicking machine.

7. A presser member comprising an arm, a cap separable from the arm, and a U-shaped clamping member adapted to secure the cap rigidly to the arm.

8. In a clicking machine, a presser member comprising a chambered arm, a cap, and

clamping means received in the chambered portion of the arm and adapted to secure the cap rigidly to the arm.

9. A clicking machine having a cutting block, a post, a presser member comprising an arm composed of metal of relatively low density as compared with the density of iron, a cap, and clamping means securing the cap and the arm of the presser member to the post, said presser member being mounted for reciprocating movement toward and from the block and for movement laterally over the block and said clamping means comprising a reinforcing member of relatively great tensile strength to resist stresses tending to bend or break the presser member during pressure applying operations.

10. A presser member for clicking machines comprising a body portion composed of metal of relatively low density as compared with the density of iron, a cap, and a reinforcing member of high tensile strength constructed and arranged to secure the cap to the body portion of the presser member and to resist stresses tending to bend or break the presser member.

11. A clicking machine having a cutting block, a reciprocating presser member extending over the block and comprising an arm supported at one end and having an internal reinforcing member adapted to resist stresses developed upon reciprocation of the presser member and tending to bend or break the presser member.

12. A presser member for clicking machines comprising a body portion having an internal reinforcing member adapted to resist stresses tending to bend or break the presser member.

13. A presser member for clicking machines comprising a body portion composed of metal of relatively low density as compared with the density of iron, and having an internal reinforcing member of high tensile strength adapted to resist stresses tending to bend or break the presser member.

14. A clicking machine having a cutting block, and a reciprocating presser member extending over the block, said presser member comprising an arm supported at one end and having an internal reinforcing member angularly disposed with relation to the pressure applying face of the presser member to resist stresses developed upon reciprocation of the presser member and tending to bend or break the presser member.

15. A clicking machine having a cutting block, and a reciprocating presser member extending over the block, said presser member comprising an arm supported at one end and having an internal reinforcing member in its lower part and a second reinforcing member in its upper part, said reinforcing members being adapted to resist stresses developed upon reciprocation of the presser member and tending to bend or break it.

16. A clicking machine having a cutting block, a post, a presser member comprising an arm extending over the cutting block, and a U-shaped clamping member adapted to secure the arm of the presser member to the post.

17. A clicking machine having a cutting block, a post, a presser member comprising an arm extending over the cutting block, and clamping means comprising a reinforcing member arranged to secure the arm of the presser member to the post.

18. A clicking machine having a cutting block, a post, a reciprocating presser member extending over the block, said presser member comprising a body portion composed of metal of relatively low density as compared with the density of iron, and a reinforcing member of high tensile strength constructed and arranged to clamp the presser member to the post and to resist stresses tending to bend or break the presser member.

19. A clicking machine having a cutting block, a post, a reciprocating presser arm extending over the block and means comprising a U-shaped member composed of material of high tensile strength and arranged to constitute a reinforcing member for the presser arm.

20. In a clicking machine, a frame, a cutting block, a presser member comprising an arm constructed and arranged for movement laterally of the cutting block, and a pair of rigidly connected, spring-pressed plungers, mounted on opposite sides of the arm, constructed and arranged to lessen the shock of the blow when the presser member comes in contact with the frame upon lateral movement in either direction away from the operator, and to return said member toward the operator.

21. A clicking machine having a presser arm, a buffer mechanism comprising plungers mounted on opposite sides of said arm, means for connecting said plungers, and a spring for each plunger.

22. A clicking machine comprising a frame, a cutting block, a presser member movable laterally over the cutting block and spring-pressed plungers mounted on opposite sides of the presser member constructed and arranged to effect a rebound of the presser member when said member is moved in such manner as to cause either plunger forcibly to engage with the frame of the machine.

In testimony whereof I have signed my name to this specification.

MILTON H. BALLARD.