

Oct. 5, 1954

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2,690,561

APPARATUS FOR INSERTING AND EXTRACTING THUMB TACKS

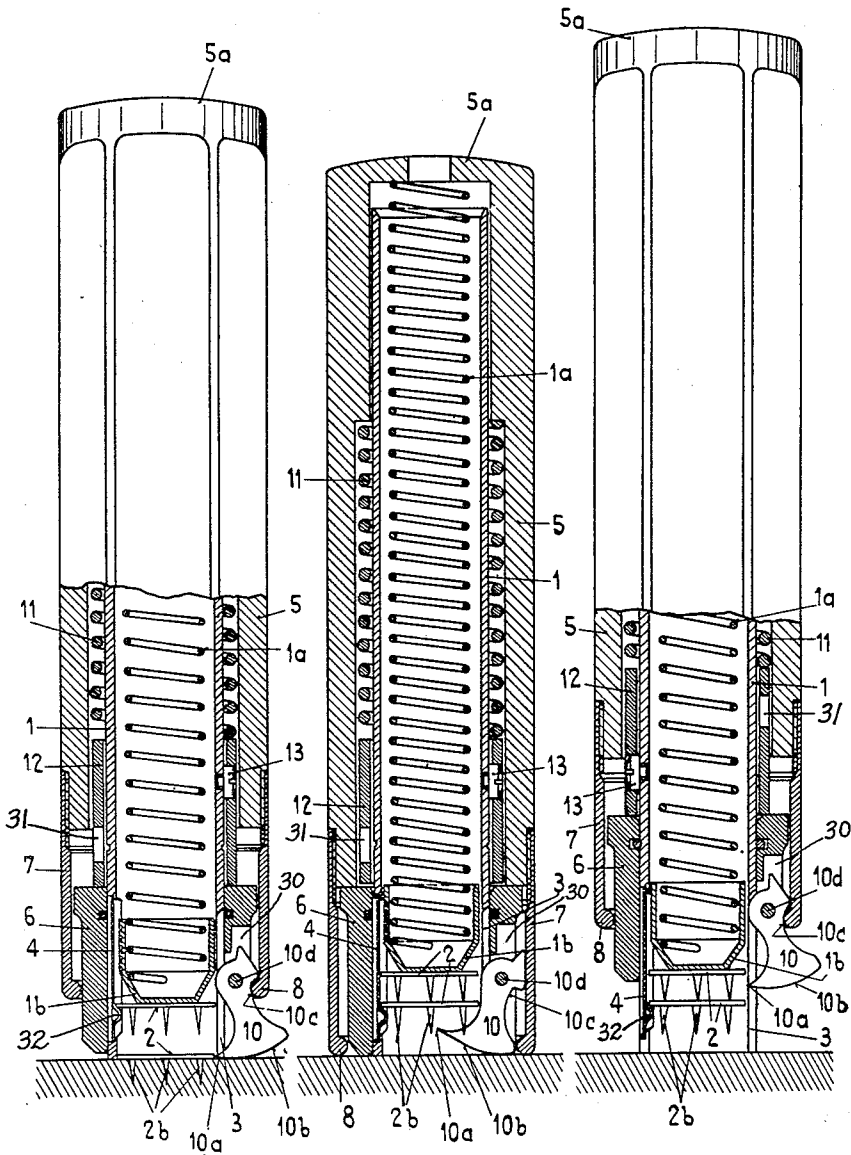
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Fig. 4

Fig. 5

Fig. 6

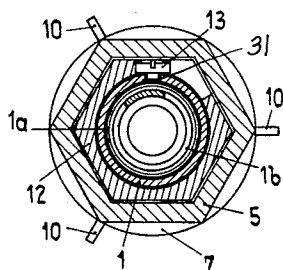
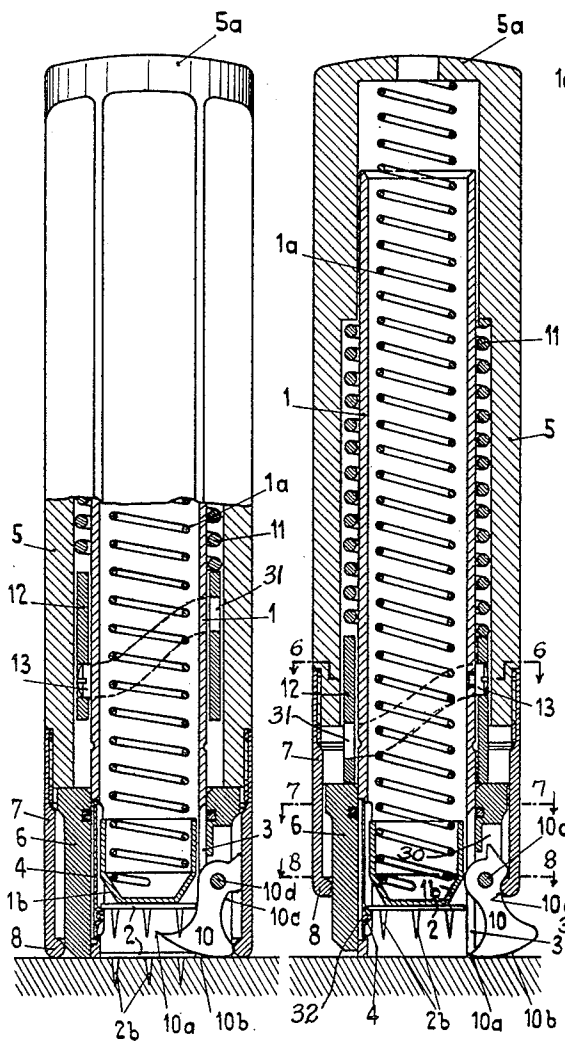


Fig. 7

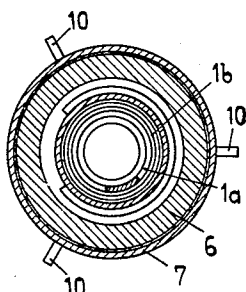
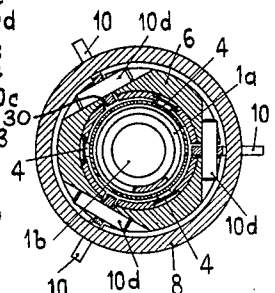


Fig. 8



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UNITED STATES PATENT OFFICE

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APPARATUS FOR INSERTING AND
EXTRACTING THUMBTACKS

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3 Claims. (Cl. 1—90)

1

This invention relates to an apparatus for inserting and withdrawing or extracting tacks and particularly those having relatively short prongs and flat heads, and especially those known as thumb tacks.

It is an object of the invention to provide means affording stacking or disposing a plurality of the tacks in superposed relation for the successive insertion of the tacks into suitable penetrable material or surfaces.

It is another object of the invention to provide means facilitating withdrawal of previously-inserted tacks from said surface and when so extracted or withdrawn, to collect such tacks in orderly fashion and stacked relation again for later or repeated re-use and reinsertion in such surface.

It is a still further object of the invention to provide means conducive to a simple, hand-operated device which is very effective in operation, ensures speedy handling of the tacks, is inexpensive to manufacture and may be manipulated even by unskilled persons.

With these and other objects to be hereinafter set forth in view, I have devised the arrangement of parts to be described and more particularly pointed out in the claims appended hereto.

In the accompanying drawings, wherein an illustrative embodiment of the invention is disclosed, Fig. 1 is a front elevation of the device, with the lower portion of the same in section, showing the first step in the act of extracting a previously-inserted tack;

Fig. 2 is a vertical sectional view through the device, showing the tack extracted and elevated in position within the device in readiness for re-insertion;

Fig. 3 is a view, somewhat similar to Fig. 1, showing the device with its parts in position for the removal of the lowermost tack in the magazine and its insertion;

Fig. 4 is a view similar to Fig. 3 but showing the tack in the process of being inserted;

Fig. 5 shows the device in the position in which it appears after having inserted the tack;

Fig. 6 is a sectional view, taken substantially on the line 6—6 of Fig. 5 and looking in the direction of the arrows;

Fig. 7 is a sectional view, taken substantially on the line 7—7 of Fig. 5, and looking in the direction of the arrows;

Fig. 8 is a sectional view taken substantially on the line 8—8 of Fig. 5, looking in the direction of the arrows.

Referring to the drawings, 1 indicates the

2

magazine for holding a plurality of the thumb tacks 2 in superimposed or stacked relation, and with their prongs 2b directed downwardly. Said magazine is in the form of a tube or cylinder constituting a casing open at the top and bottom. The internal diameter of the magazine 1 is such as to accommodate the heads of the tacks and vertically guide the same. At its lower end, from which the tacks successively emerge, the magazine or casing 1 is provided with three leaf springs 4 equally spaced around the circumference and formed with inward protuberances 32 near their lower ends to engage under the heads of the stacks to retain the tacks in the magazine. These springs are capable of being flexed as required to permit the tacks to be forced down past the protuberances 32 as the tacks are forced out of the magazine in inserting them, and also to permit an extracted tack to re-enter the device and be held for re-insertion, as will be hereinafter explained. The lower open end of the magazine is also provided in its side wall with three longitudinally-extending slots 3 through which three pivotally mounted jaws 10 are moved.

Located within the tubular magazine 1 is a cup-shaped follower 1b, which is normally urged against the stack of tacks 2 in the magazine by means of a coil spring 1a, located within the magazine 1 and having one end disposed against the follower 1b and its other end contacting the closed end 5a of a housing or handle 5 which fits around the tubular magazine 1.

For use in the described apparatus, the tacks 2 are preferably those which are provided with at least three prongs 2b dependent from the head of the tack. This type of tack permits stacking of a number of the tacks within the magazine, with their points directed downwardly, as clearly seen in the drawings.

Surrounding the outside of the magazine 1 and rotatably mounted thereon adjacent to the lower open end of the magazine, is a ring 6 which is movable axially relative to the magazine, and said ring is provided with three slots 30 in its wall spaced equally around its circumference and in registry with the three slots 3 in the magazine 1. Mounted between the sides of each of the slots 30 is one of the jaws 10, each jaw being pivotal on a pivot pin 10d. These jaws operate to both insert and extract the thumb tacks 2 in a manner to be described. To enable the jaws to extract the tacks, each of the jaws is provided with a claw-shaped or pointed end 10a, and with a rounded under surface 10b.

Also surrounding the magazine 1 is a ring 12

3

located above the ring 6, and said ring 12 is also slidable in an axial direction on the magazine 1 and within the handle or housing 5. The ring 12 is under pressure of a coil spring 11 which surrounds the outside of the magazine 1 and holds the ring 12 against the ring 6. The ring 12 is provided with a spiral slot 31 into which a radially-projecting screw 13 on the magazine 1 projects. As will be seen in Fig. 6, the outside shape of the ring 12 is a hexagonal and the same fits within the housing or handle 5 which is internally shaped in hexagonal form to thus conform to the exterior shape of the ring 12 and thereby prevent rotative movement of the ring 12 within the housing 5.

At its lower end, the housing or handle 5 is provided with an attached cylindrical sleeve 7, formed at its lower end with a bead 8 which is adapted for engagement with the surfaces 10c of the jaws 10 during the operation of the device. The engagement between the bead 8 and the surfaces 10c of the jaws also limits the extent to which the ring 6 can be urged out of the lower end of the sleeve 7 (as shown in Fig. 5). Normally the jaws 10 are disposed with their pointed ends 10a just entering the slots 3 in the wall of the magazine 1, or in the position shown in Figs. 3 and 5.

From the foregoing, the operation of the device will be readily understood. The normal position of the device is that shown in Fig. 1, at which time it is arranged to tack-extraction. To this end, the tubular magazine 1 protrudes to a very small extent out beyond the lower end of the ring 6. When it is desired to extract a previously-inserted tack, the device, with the parts in the position shown in Fig. 1, is held vertically above the tack, with the lower end of the magazine surrounding the head thereof. Direct downward pressure of the hand is now applied to the upper end of the housing 5, and this will force the housing downwardly, in opposition to the pressure of the spring 11 and cause the three jaws 10 to be swung inwardly. The bead 8, acting as a cam against the surface 10c on the jaws will cause this inward swing of the jaws 10. As the jaws 10 are thus swung inwardly, their pointed ends 10a will take under the head of the inserted tack 2, and the curved under surfaces 10b of the jaws operating cam-like against the surface of the material in which the tack is embedded, will cause elevation of the pointed ends of the jaws and result in a raising movement of the tack. As the tack is thus extracted, it will be lifted or forced upwardly within the magazine and back into position therein above the protuberances 32 on the springs 4 as shown in Fig. 2 to be retained in the magazine thereby for subsequent re-insertion.

When it is desired to insert a tack, the device is held in the hands, with the fingers of one hand gripping the protruding portion of the ring 6 between the jaws 10, while the fingers of the other hand engage the housing 5 and turn it in a counterclockwise direction as viewed from the top end 5a of the housing, as far as it will go. This relative movement between the housing or handle 5 and the ring 6, will cause the magazine 1 to have its lower end extended out beyond the end of the ring 6, to the extent seen in Fig. 3. This projecting movement of the magazine 1 is attained through the travel of the screw 13 in the spiral slot 31 as the handle or housing 5 is rotated. When the magazine has been projected in the manner just described, it will move

4

the lowermost tack 2 in the magazine to a position beyond the jaws 10, as seen in Fig. 3. To affix said lowermost tack simply requires placing the device with the projecting end of the magazine against the surface of the penetrable material and pressing down smartly on the upper end 5a of the handle or housing 5. As the handle or housing 5 is depressed, the bead 8, operative against the surfaces 10c of the jaws 10, will swing the jaws inwardly to position them above the lowermost tack in the magazine. Further downward movement of the housing 5 will bring the curved under surfaces 10b of the several jaws 10 down upon the head of the tack to thereby force the prongs of the same into the penetrable material against which the device has been placed. On this last-mentioned downward movement of the housing or handle 5, the ring 6 will be moved downwardly while the magazine 1 is stationary, and thus, as the ring 6 is moved downwardly, the jaws 10 will go down with it and forcibly thrust the prongs of the tack into the surface of the penetrable material as shown in Fig. 4.

When it is desired to restore the device into its normal or tack-extracting position, shown in Figs. 1 and 5, the device is held in the hands in the manner previously described and the housing is rotated in a clockwise direction. The action of the screw 13 in the spiral groove 31 will then be such as to retract the magazine 1 and hold it in such retracted position until required to be advanced for tack insertion by manual operation of the device in the manner previously explained.

By the described device, thumb tacks can be successively applied to any suitable penetrable material and can also be withdrawn, and when so withdrawn will be automatically replaced in or restored to the magazine for future use. The thumb tacks are forced into inserted position and drawn out by direct and even pressure so that, as a result bending of the prongs will not occur and the tacks will not be wasted but can be re-used repeatedly.

Accordingly, there has been provided a device for inserting and extracting tacks comprising a magazine in the form of a casing holding a stack of headed tacks, the casing having an open end through which the tacks are successively driven, a housing extending over the casing and axially movable relative to the casing, means operable on rotative movement of the housing in one direction to extend the open end of the casing out of one end of the housing and operable to retract the casing when the housing is rotated in the opposite direction, pivoted jaws arranged adjacent the open end of the casing, means on the housing to swing said jaws toward one another and in advance of the lowermost tack in the stack while the casing is in retracted position to remove a driven tack and to swing the jaws toward one another when the casing is in extended position to thereby cause said jaws to engage over the head of the lowermost tack in the stack and drive the same.

Having described one embodiment of the invention, it is obvious that the same is not to be restricted thereto, but is broad enough to cover all structures coming within the scope of the annexed claims.

What I claim is:

1. A device for inserting tacks into a penetrable surface, comprising a magazine in the form of a tubular casing for holding a stack of headed tacks and having an open end, a spring-

5

6

urged follower in the casing for application against the top of said stack of tacks and tending to urge the tacks toward the open end of the casing, spring means disposed adjacent the open end of the casing for normally preventing emergence of the tacks therefrom, the casing being slotted at its open end, a ring member fitted around the casing adjacent to its open end and carrying a plurality of pivoted jaws movable through the slots in the casing toward the longitudinal axis of the casing, a housing mounted over the casing and movable axially thereof, means operable on relative rotative movement of the casing and housing with respect to one another for advancing the open end of the casing beyond an end of the housing to thereby locate the lowermost tack of the stack beyond the jaws, cam means carried by the housing and operative on the jaws to swing said jaws inwardly and over the head of said lowermost tack on axial movement of the housing while the casing is in its advanced position, the housing being also axially movable relative to the ring member whereby the inwardly-swing jaws will drive said lowermost tack on said relative movement of the housing with respect to the ring member.

2. A device for inserting and extracting tacks comprising a magazine in the form of a casing holding a stack of headed tacks, the casing having an open end through which the tacks are successively driven, a housing extending over the casing and axially movable relative to the casing, means operable on rotative movement of the housing in one direction to extend the open end of the casing out of one end of the housing and operable to retract the casing when the housing is rotated in the opposite direction, pivoted jaws arranged adjacent the open end of the casing, means on the housing to swing said jaws toward one another and in advance of the lowermost tack in the stack while the casing is in retracted position to remove a driven tack and to swing the jaws toward one another

when the casing is in extended position to thereby cause said jaws to engage over the head of the lowermost tack in the stack and drive the same.

3. A device for inserting and extracting tacks comprising, a tubular magazine for holding a stack of headed tacks, said magazine being provided with an open lower end through which tacks are successively driven for insertion, means adjacent the open lower end of the magazine for engaging the lowermost tack in the stack and holding the same from displacement, a spring-urged follower in the magazine for urging the stack of tacks toward said means, a ring surrounding the magazine at its lower end, said ring carrying a plurality of pivoted claw-like jaws, the magazine being slotted to permit said jaws to move toward one another and partially enter the lower portion of the magazine, a handle in the form of a housing fitted over the magazine and the ring, said housing having an open lower end through which the ring and lower end of the magazine are movable, means operable by rotative movements of the handle relative to said ring for advancing the lower end of the magazine out of the housing or retracting the same into the housing, means operative by axial movements of the housing relative to the magazine for swinging the jaws toward one another while the magazine is either advanced or retracted, whereby said jaws will insert a tack while the magazine is advanced and will extract a tack and restore it to the magazine when the magazine is in a retracted position.

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