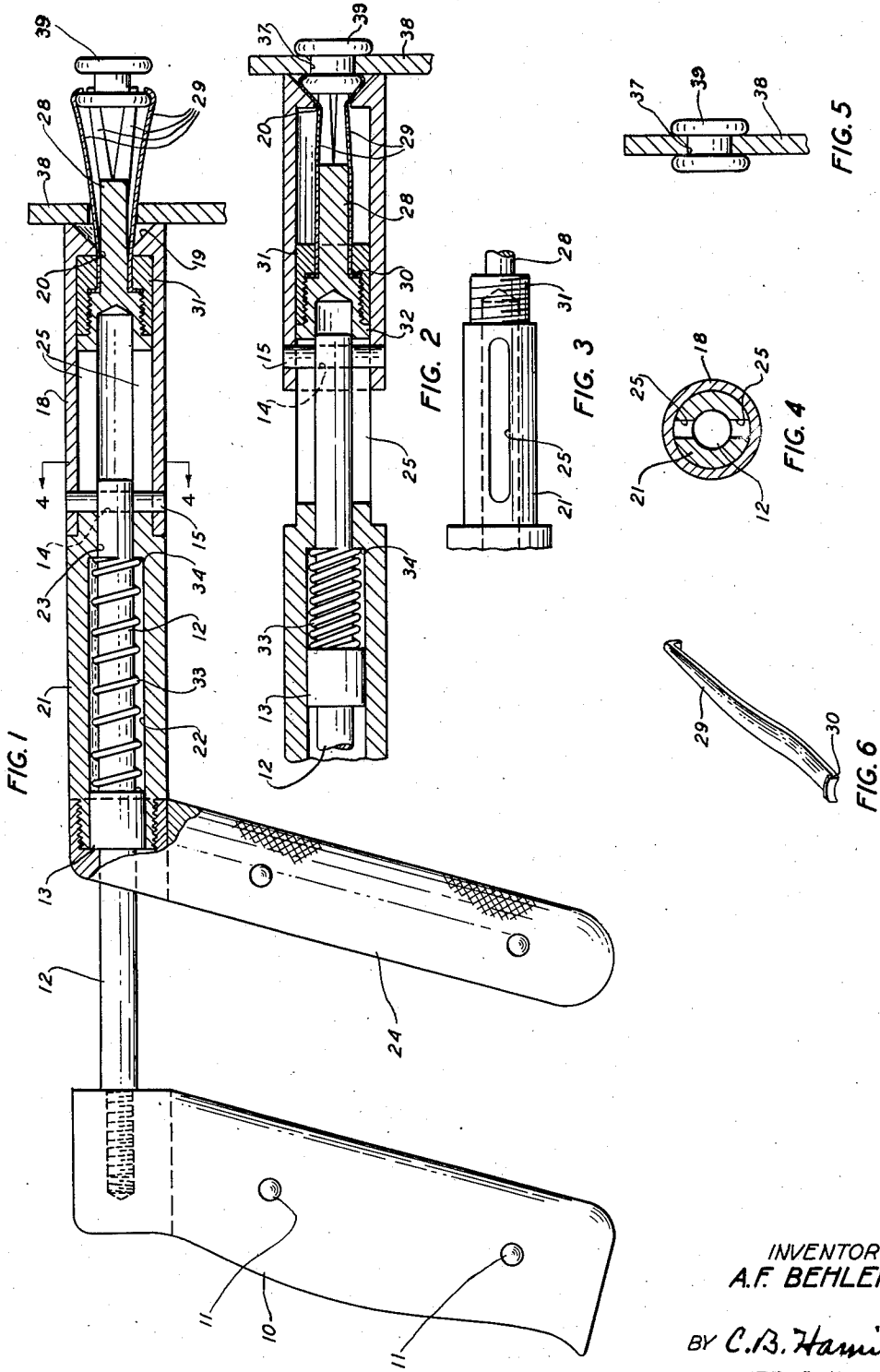


April 26, 1949.

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TOOL FOR ASSEMBLING COMPRESSIBLE
GROMMETS IN OPENINGS
Filed April 23, 1946

2,468,286



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2,468,286

TOOL FOR ASSEMBLING COMPRESSIBLE GROMMETS IN OPENINGS

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Application April 23, 1946, Serial No. 664,351

9 Claims. (Cl. 218—25)

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This invention relates to assembly tools and more particularly to a tool for installing compressible objects such as rubber grommets in prepared apertures in a material, wherein the heads of the grommets are larger than the apertures.

An object of the invention is to provide a practical and efficient tool for quickly installing rubber grommets without injury to an operator's hands.

One embodiment of this invention comprises a hand tool of the pistol grip type having a plurality of diverging spring fingers which are cammed against the wall of an opening in a material to force the fingers toward each other and compress a rubber grommet while drawing it into the opening. The fingers are secured to a tubular member which is pulled back by a pistol grip mechanism into a stationary cylinder of the tool whereby a conical opening therein further cams the fingers closer together and further compresses the grommet being installed.

Other objects and advantages of the invention will be more fully understood from the following detailed description when taken in conjunction with the accompanying drawings, wherein:

Fig. 1 is a front elevational view, partly in section, of the tool showing the spring fingers thereof inserted through an aperture in a panel of material and gripping one end of a rubber grommet to be installed;

Fig. 2 is a fragmentary sectional view of the tool showing the position of the parts thereof with the rubber grommet installed;

Fig. 3 is a fragmentary plan view of the tubular member to which the gripping fingers are secured;

Fig. 4 is a cross-section on the line 4—4 of Fig. 1, looking in the direction indicated by the arrows;

Fig. 5 is a cross-sectional view of a part of a panel showing a rubber grommet installed therein by the tool; and

Fig. 6 is a perspective view of one of the spring gripping fingers of the tool.

Referring now to the drawings, wherein like reference numerals designate similar parts throughout the several views, 10 is a handle made in two parts of phenol fiber or any other suitable material. The two parts of the handle are secured together by rivets 11. Threaded into the upper part of the handle 10 is a steel rod 12 having an integral collar 13 near its central portion and having an aperture 14 in its right hand end (Fig. 1). Secured in this aperture 14 is a pin 15

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which fastens the rod 12 to a stationary cylinder 18. The cylinder 18 terminates at its right hand end in an inwardly extending opening 19 which is shaped like the frustum of a cone and provides an inner camming shoulder 20.

Telescoped within the left portion of the fixed cylinder 18 is a tubular member 21 which has a bore 22 in sliding contact with the collar 13. Another smaller bore 23 in the tubular member concentric with bore 22 provides sliding engagement with the rod 12. The left end (Fig. 1) of this tubular member 21 has a trigger or handle 24 secured to it, which handle cooperates with the handle 10 in a pistol-trigger grip action in an operator's hand.

As shown in Figs. 2, 3, and 4, the right portion of the tubular member 21 has a longitudinal slot 25 to provide clearance for the stationary pin 15 when the member 21 is reciprocated. This slot is of a length equal to the greatest rearward travel of the tubular member 21 when actuated by the handle or trigger 24. The tubular member 21 terminates at its right end in a stud 28 around which are placed six steel spring gripping fingers 29 having upturned ends 30. These spring fingers 29 are locked in position on the stud 28 by a sleeve 31 which is threaded onto a shoulder 32 of the tubular member 21 to clamp the upturned ends 30 against the shoulder.

The longitudinally movable assembly of handle 24, member 21 and fingers 29 is normally held in the position shown in Fig. 1 by a compression spring 33 which is coiled around the rod 12 inside the bore 22 of the tubular member. One end of the coil spring 33 abuts against the collar 13 of the rod 12 and the other end presses against a shoulder 34 of the tubular member 21.

In operating the tool, the spring gripping fingers 29 are first pushed through an opening 37 in a panel 38 into which a rubber grommet 39 is to be inserted. The tool is so held that the outer end of the cylinder 18 rests against the panel 38. One head of the rubber grommet, as disclosed in Fig. 1, is then placed between the diverging gripping fingers 29. Upon actuation of the trigger handle 24 by the operator to move it toward the handle 10, the tubular member 21 moves toward the left to compress the coil spring 33. This movement of the member 21 causes the spring fingers 29 gripping one head of the rubber grommet to move to the left thereby camming the gripping fingers 29 against the wall of the opening 37 in the panel 38 to force the fingers toward each other to compress the head of the grommet while drawing it toward the opening in

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the panel. As the fingers 29 continue their travel toward the left, they are forced further together by the camming action of the shoulder 20 on the fingers. The gripping fingers thus compress one head of the rubber grommet down to sufficient size that it is pulled through the opening in the panel 38 as the trigger handle 24 reaches the end of its travel toward the left as determined by the length of the longitudinal slot 25 in cooperation with the stationary pin 15 as hereinbefore described.

After the grommet is inserted in the panel, the operator releases the trigger handle 24 and the compression spring 33 then forces the tubular member 21 and the gripping fingers 29 toward the right to release the head of the grommet and permit it to spring back to its normal size as shown in Fig. 5.

Although the invention as herein described and illustrated is particularly well adapted for use in installing rubber grommets, it is to be understood that the novel features thereof are capable of many other applications and modifications and should be limited only by the scope of the appended claims.

What is claimed is:

1. In a tool for inserting a compressible object in an opening in another object, a circumferential series of diverging spring fingers adapted to be extended through the said opening, means for holding the fingers in a forwardly projecting position forwardly of the tool proper and extending through said opening, means for forcing the fingers toward each other to grip and compress an object, and means for actuating the holding means to render the forcing means effective to cam the fingers inwardly to compress the object circumferentially and insert it in the opening.

2. A tool for inserting a rubber grommet in an opening in an object comprising a multiplicity of resilient fingers to be extended through the said opening and for holding a head of a rubber grommet about the periphery thereof and which head is larger than said opening, means for securing the fingers in a diverging relationship, and means for reciprocating the spring fingers and their securing means whereby the fingers may be cammed against the wall of the opening in the object to compress the head of the rubber grommet substantially uniformly about its periphery to pull it into the opening and then release it.

3. In a tool for inserting a compressible grommet in an opening in an object, a plurality of resilient fingers adapted to be inserted through said opening and for holding the compressible grommet, a cylinder having an end engageable with the said object, a tubular member slidable in the cylinder and for holding the fingers, means within the cylinder for camming the fingers together to compress the grommet, means for moving the tubular member and the fingers relative to the cylinder whereby the fingers engage the camming means to force them together to compress the grommet and pull it into the opening, and resilient means within the tubular member for restoring the fingers to their extended position.

4. In a tool for inserting a compressible object into an opening in another object, a handle, a rod fixed to the handle, a cylinder secured to the rod, a second handle spaced from the first handle and movable toward it on the rod in a pistol-trigger grip action, a tubular member slidable on the rod and partly within the cylinder and having one end fastened to the second handle, a

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plurality of spring fingers for holding an object to be compressed, means on the other end of the tubular member for securing the fingers thereto, means integral with the cylinder for camming the fingers together to compress the object so that it can be inserted in the opening in said second object when the second handle is moved toward the first handle, and means for returning the second handle to a normal spaced relationship relative to the said first handle.

5. In a tool for inserting a compressible object in an opening in another object, a plurality of resilient fingers adapted to be inserted through said opening and to hold the compressible object, a cylinder having an end engageable with the said second object, a tubular member slidable in the cylinder and for holding the fingers, means secured to the cylinder for limiting the sliding movement of said tubular member, means within the cylinder for camming the fingers together to compress the compressible object, and means for moving the tubular member and the fingers whereby the fingers engage the camming means to force them together to compress the object and pull it into the opening.

6. In a tool for inserting a compressible object in an opening in another object, a circumferential series of diverging spring fingers to be extended through the opening for gripping the compressible object, means for holding the fingers in said diverging position forwardly of the tool proper, means for moving the holding means and the fingers inwardly of the tool, means to cam the fingers radially toward each other to compress the object and pull it into the opening, and guide means associated with the moving means to cause the fingers to move in straight line reciprocation.

7. In a tool for inserting a compressible object in an opening in another object, said compressible object being larger than said opening, a circumferential series of diverging spring fingers, means for holding the fingers in diverging position forwardly of the tool proper, means for moving the holding means and the fingers inwardly of the tool, and means to cam the fingers radially toward each other to compress the compressible object and pull it into the opening.

8. In a tool for inserting a compressible object in an opening in another object, a handle, a cylinder, means for securing the cylinder to the handle, a second handle, a tubular member telescoped within said cylinder and secured at one end to said second handle, a plurality of resilient fingers adapted to be extended through said opening for holding the compressible object, means on the other end of the tubular member for securing the fingers thereto, means integral with the cylinder for camming the fingers together to compress the object so that it can be inserted in the opening when the tubular member is partially withdrawn from the cylinder by movement of the second handle toward the first.

9. In a tool for inserting a rubber grommet in an aperture in an object, a plurality of resilient fingers to be extended through the said aperture for engaging a head of a rubber grommet, the head of said rubber grommet being larger than said aperture, a handle, a cylinder, means for securing said cylinder to the handle, a second handle spaced from the first handle and movable toward it, a tubular member partially telescoped within the cylinder and having one end secured to the second handle, and means on the other end of the tubular member for securing the fingers thereto, said second handle being adapted

to move towards the first handle to cause the fingers to be drawn internally of said cylinder and simultaneously to be cammed against the wall of the aperture to grip and compress the head of said rubber grommet, and means integral with the cylinder for further camming the fingers together to compress the object so that it is pulled into the aperture in the object upon further movement of the second handle toward the first.

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REFERENCES CITED

The following references are of record in the file of this patent:

FOREIGN PATENTS

Number	Country	Date
32,334	Denmark	Oct. 1, 1923
322,885	Germany	June 22, 1919