

July 10, 1951

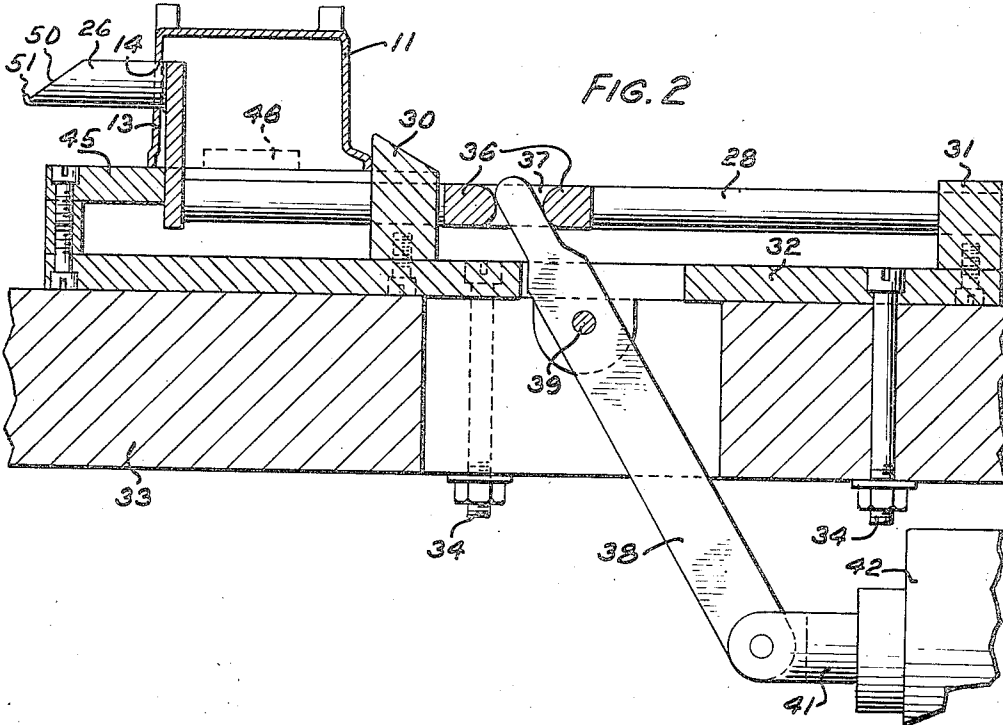
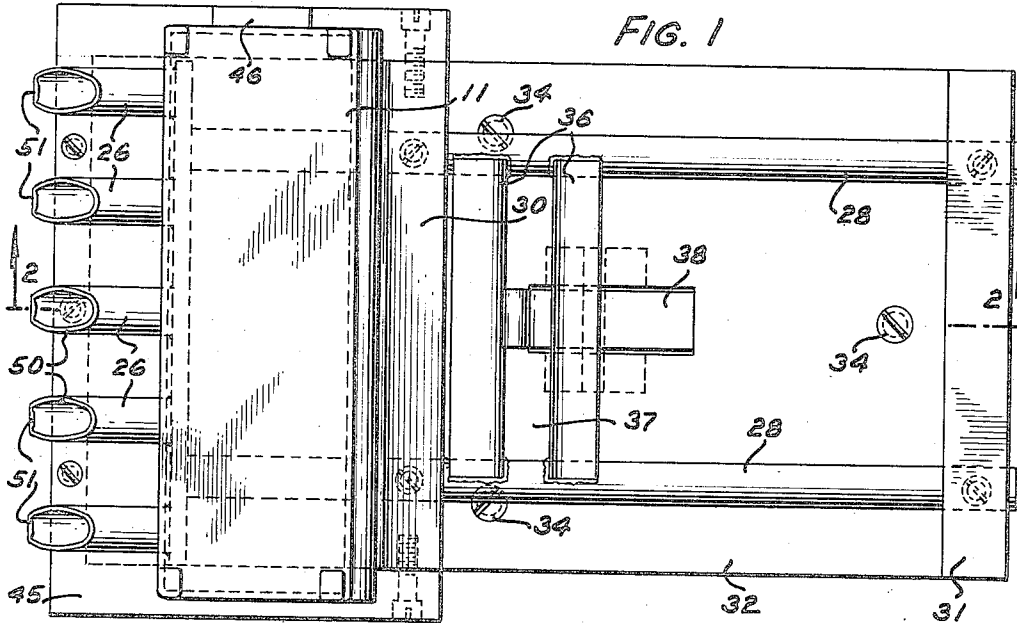
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2,559,847

GROMMET INSERTING MECHANISM

Filed Jan. 24, 1948

2 Sheets-Sheet 1



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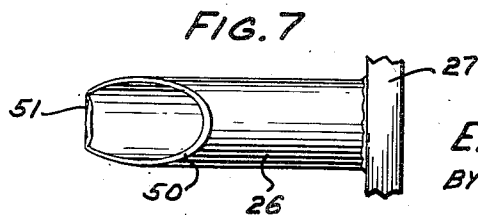
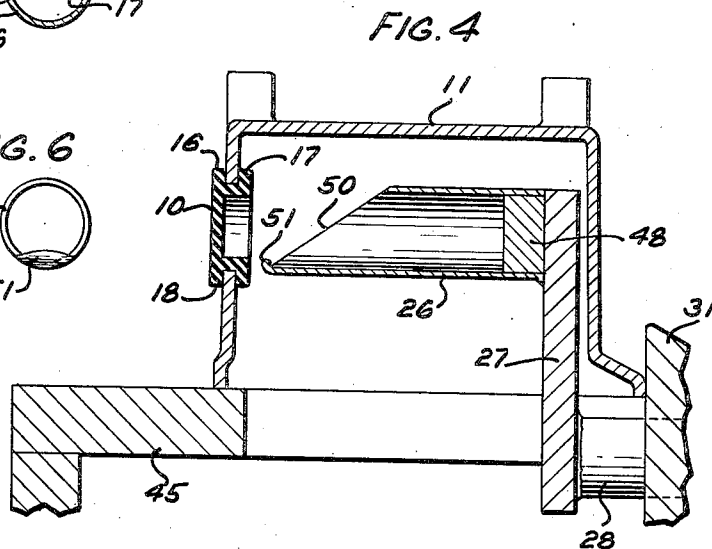
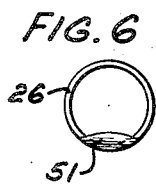
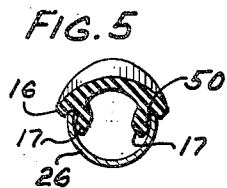
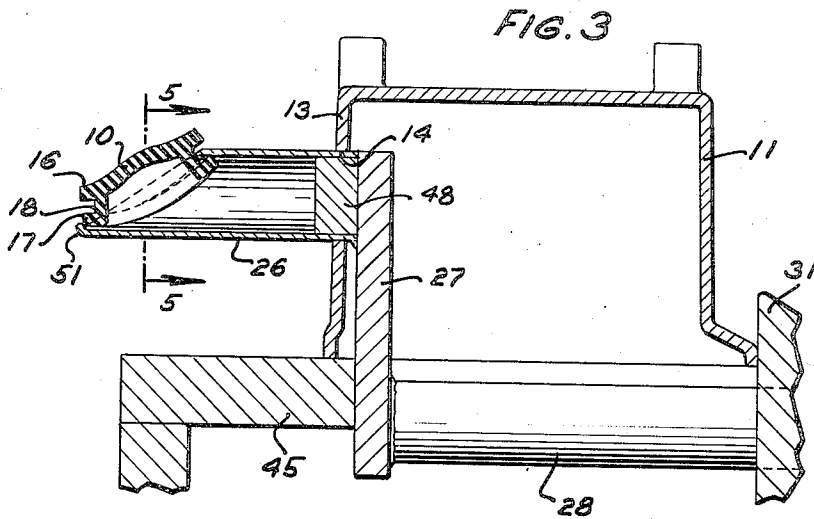
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2,559,847

GROMMET INSERTING MECHANISM

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Application January 24, 1948, Serial No. 4,149

3 Claims. (Cl. 218—25)

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This invention relates to grommet inserting mechanism and more particularly to a device for simultaneously inserting a plurality of grommets in apertured articles.

It is an object of the present invention to provide a mechanism for efficiently and effectively inserting resilient grommets in holes.

In accordance with one embodiment of the invention, there is provided a device having a plurality of hollow tools fixed to a reciprocable power actuated cross head and the front end of each tube is cut off obliquely to form an elliptical receptacle or seat for receiving the grommet in laterally compressed condition therein and each tube has an inwardly extending lip formed on the tip thereof to engage and retain the grommet in the tool. An article having an apertured wall in which the grommets are to be assembled is placed on the device and the tools are advanced to pass the front ends thereof through the apertures, after which grommets are applied in compressed condition to the inclined front end of each tool and the tools are withdrawn through the apertures to cause the insertion of the grommets in the apertures of the article.

The invention will be more fully understood by reference to the following detailed description thereof and the accompanying drawings illustrating a preferred embodiment thereof in which:

Fig. 1 is a plan view of the grommet inserting device showing a cable terminal box in position thereon and with the tools extending through the apertures in one wall thereof;

Fig. 2 is a vertical sectional view of the device taken on the line 2—2 of Fig. 1;

Fig. 3 is an enlarged vertical sectional view through a portion of the device showing a tool extending through the apertured wall of the box and having a grommet inserted therein;

Fig. 4 is a fragmentary view similar to Fig. 3 showing the tool in retracted position and the grommet in assembled position on the box;

Fig. 5 is a detail cross section taken on the line 5—5 of Fig. 3 showing a tool with a grommet assembled therein;

Fig. 6 is a detail end elevation of one tool; and
Fig. 7 is an enlarged detail plan view of one tool.

The embodiment of the grommet inserting device selected to illustrate the invention is designed to insert a plurality of grommets 10 in a cable terminal box 11. The cable terminal box 11, as shown herein, comprises a five-walled box having an open top adapted to be closed by a cover (not shown) and has a wall 13 provided

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with a plurality of circular apertures 14 adapted to be closed by rubber grommets 10. The grommets 10 are of conventional construction having outer and inner peripheral edge portions or flanges 16 and 17, respectively, separated by an annular groove 18 and adapted to engage the opposite sides of the wall 13 when assembled thereon.

The device 25 for assembling the grommets comprises a plurality of hollow tools 26 secured to a reciprocable cross head 27, which is fixed to one end of a pair of rods 28—28. The rods 28 are slidably mounted in a pair of cross frame members 30 and 31 extending upwardly from a base plate 32, which may be suitably secured to a table or bench 33, as by a plurality of bolts 34—34 (Fig. 2). The rods 28 are rigidly connected together for sliding movement by a pair of tie members 35—36 welded thereto and spaced apart to form a slot 37 into which the reduced end of an actuating lever 38 is positioned. The actuating lever 38 is pivotally mounted intermediate its ends on a pin 39 supported from the underneath side of the base plate 32, and the lever 38, at its lower end, is connected to a piston 41 of a fluid operated actuator 42 fragmentarily illustrated in Fig. 2. The actuator 41 is of conventional design having control valves by means of which the operator may effect the forward and rearward reciprocation of the piston rod 41 to cause the reciprocation of the head 27 and the tools 26.

A plate 45, cut out to permit reciprocation of the head 27, is mounted on the base plate 32 to receive and support the box 11 with its apertures 14 aligned horizontally with the tools 26. A gage lug 46 may be provided on the plate 45 to engage the end of the box 11 to aid in coaxially aligning the apertures 14 with the tools 26. The rear edge of the box 11, when supported on the plate 25, is adapted to be engaged by the upwardly extending portion of the cross member 30 which holds the box 11 against movement to the right, as viewed in Fig. 2, during the grommet assembling operation.

The tools 26 in the embodiment herein illustrated comprise tubular members of circular cross section which, at their rear ends, are secured to the cross head 27, as previously mentioned. The tubular members, at their rear ends, may be bonded to circular plugs or inserts 48 and then bonded to the cross head 27 or, if desired, the member 48 may be secured to or formed on the cross head 27 and the tool 26 positioned on and secured thereto. The tools 26 are provided

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with sloping forward ends 50 and a transversely disposed inwardly directed lip 51 at the tip thereof. The ends 50 of the tools are formed by cutting the tool in a plane disposed obliquely with respect to the axis of the tool and the edge formed thereby is substantially elliptical with the distance of the long diameter of the ellipse being considerably greater than the small diameter of the ellipse. The elliptical edge portion of the tubular member, together with the tubular wall portions thereof, form an elongated seat or elliptical receptacle for receiving the grommet therein in laterally compressed condition, as illustrated in Figs. 3 and 5. The inner flange 17 of the grommet, when the grommet is applied to the tool, engages the inner surface of and is confined within the walls of the tool 26 and the major portion of the outer flange 16 of the grommet extends beyond the outer diameter of the tool 26. The lip 51 forms a shoulder for engaging the lower peripheral portion of the inner flange 17 of the grommet and serves to hold the grommet against axial outward displacement relative to the tool 26.

In using the device to assemble a plurality of grommets in the terminal box and with the head 27 and tools 26 in their retracted position, as indicated in Fig. 4, a box 11 may be applied to the device and positioned on the supporting plate 45 thereof with one end thereof engaging the positioning lug 46 and the side edge of the box in engagement with the cross member 30 to properly align the apertures 14 in the wall 13 thereof with the tools 26. The actuator 22 is then operated to impart motion to the head 27 and advance the tools 26 into the apertures 14 and move the sloping ends 50 through the aperture onto the other side of the wall 13 to the position indicated in Fig. 2. The operator may then laterally compress and insert a grommet in the sloping ends of each of the tools, as indicated in Fig. 3. The grommet, in this position, is inclined with respect to the axis of the tool and, as stated before, has its inner flange 17 positioned within the tubular walls of the tool 26 and has the major portion of its outer flange 16 extending radially beyond the outer surface of the tool 26. The actuator 42 is then operated to effect the rearward movement of the head 27 and the retraction of the tools 26. At a certain point in the rearward movement of each tool, the flange 16 on the upper portion of the grommet will engage the outer surface of the wall 13 and as the tool continues its movement, the upper portion of the grommet will be withdrawn from the tool and the upper portion of the flange 17 will expand and engage the inner surface of the wall 13. As the tool 26 continues its rearward movement, successive portions of the grommet are progressively withdrawn from the tool and caused to assume assembled relationship with the wall 13 until the tool 26 is entirely withdrawn and the lower portion of the inner flange 17 of the grommet is carried through the aperture 14 by the lip 51 and finally disengaged therefrom and expanded into engagement with the inner surface of the wall 13, thus

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completing the assembled relationship of the grommet with the marginal portion of the wall 13 surrounding the aperture 14. With the grommets assembled in the wall 13 of the box 11, the box may be lifted vertically from the device 25, which is then in position to receive another terminal box and start another grommet assembling cycle of operation.

It is to be understood that the above-described arrangements are simply illustrative of the application of the principles of the invention. Numerous other arrangements may be readily devised by those skilled in the art which will embody the principles of the invention and fall within the spirit and scope thereof.

What is claimed is:

1. A tool for assembling grommets comprising a single piece tubular member having a sloping end portion, and an inwardly extending transverse lip formed on the tip of the sloping end of said tubular member to form an elliptical-ended receptacle for receiving a portion of a grommet therein and supporting said grommet in a laterally compressed condition.

2. A tool for assembling grommets comprising a tube having an end face formed substantially in a plane disposed obliquely to the axis of the tube to form at the end portion of the tube an elongated receptacle for receiving a portion of the grommet therein compressed in one direction and an obliquely disposed seat for supporting said grommet obliquely relative to said tube, and a transversely and inwardly directed lip on the tip of said tube.

3. In a tool for inserting grommets into an aperture in a wall the combination of a relatively straight member adapted to be inserted into and partly through the aperture in said wall and having outer guide surfaces engageable with the edges of said aperture for guiding the member in a predetermined path relative to said aperture and parallel to the longitudinal axis of said member, said member having a recessed end portion and an obliquely disposed end surface forming an elongated receptacle and an inclined seat, respectively, for receiving a grommet therein compressed in one direction only and for supporting said grommet in an obliquely disposed position with respect to the axis of the member, said elongated receptacle having wall surfaces engageable with the side walls of said grommet to retain said grommet in position therein including a wall surface adjacent the tip of said recessed end portion extending transversely to the axis of said member.

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REFERENCES CITED

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

UNITED STATES PATENTS

| Number | Name | Date |
|-----------|------------|---------------|
| 864,226 | Blodgett | Aug. 27, 1907 |
| 2,466,952 | Jakubowski | Apr. 12, 1949 |
| 2,468,286 | Behlert | Apr. 26, 1949 |