Jan. 1, 1963 R. G. AMES 3,070,827

MASTIC APPLYING TOOL

Filed Sept. 18, 1961 3 Sheets-Sheet 1

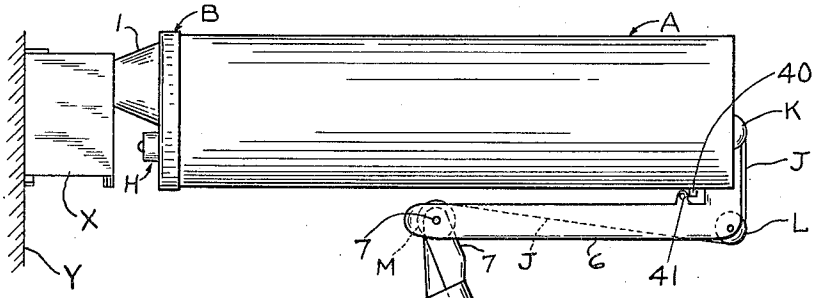


Fig. 1

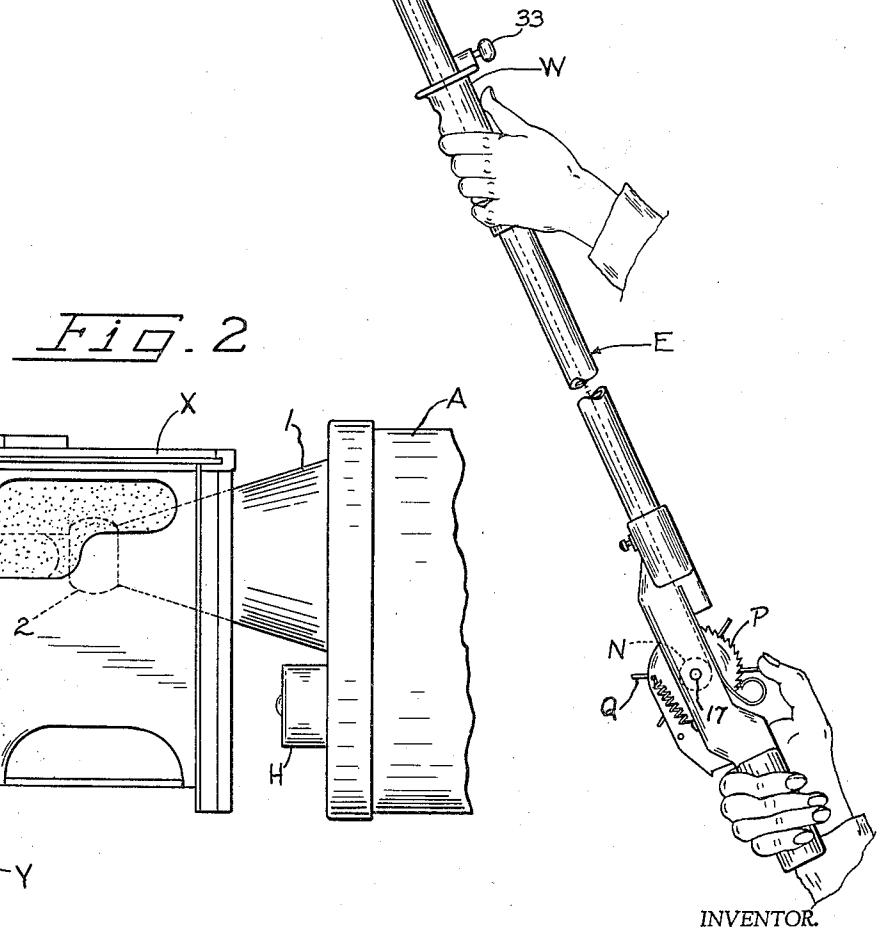


Fig. 2

INVENTOR.

ROBERT G. AMES

BY

Mann & Liddy

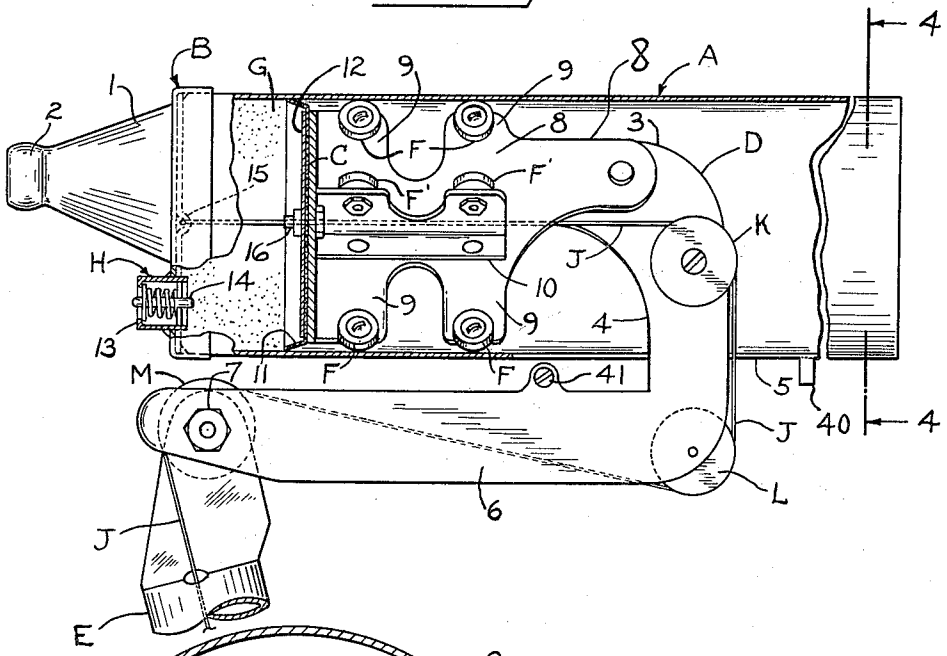
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MASTIC APPLYING TOOL

Filed Sept. 18, 1961 3 Sheets-Sheet 2

Fig. 3



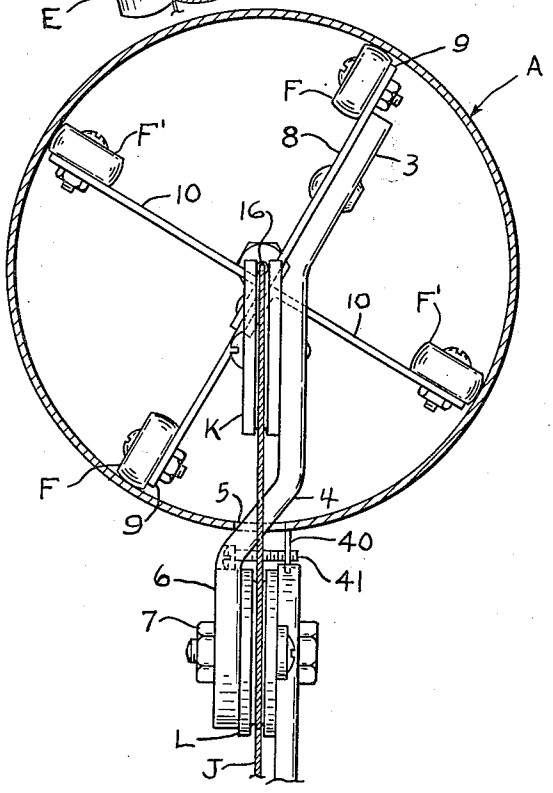


Fig. 4

INVENTOR.
ROBERT G. AMES
BY
Munn & Liddy
ATTORNEYS

Jan. 1, 1963 R. G. AMES 3,070,827

MASTIC APPLYING TOOL

Filed Sept. 18, 1961 3 Sheets-Sheet 3

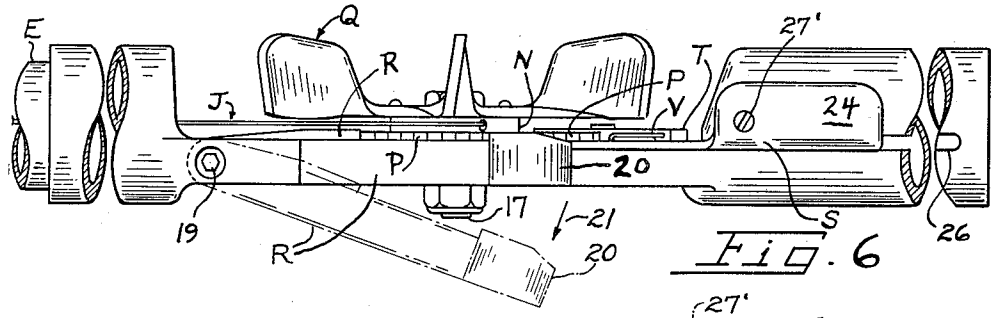


Fig. 6

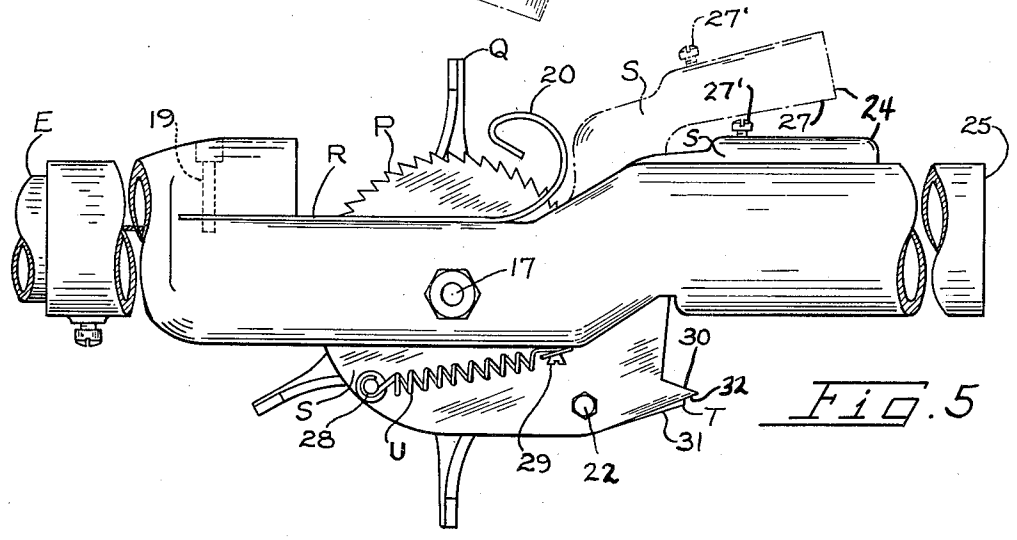


Fig. 5

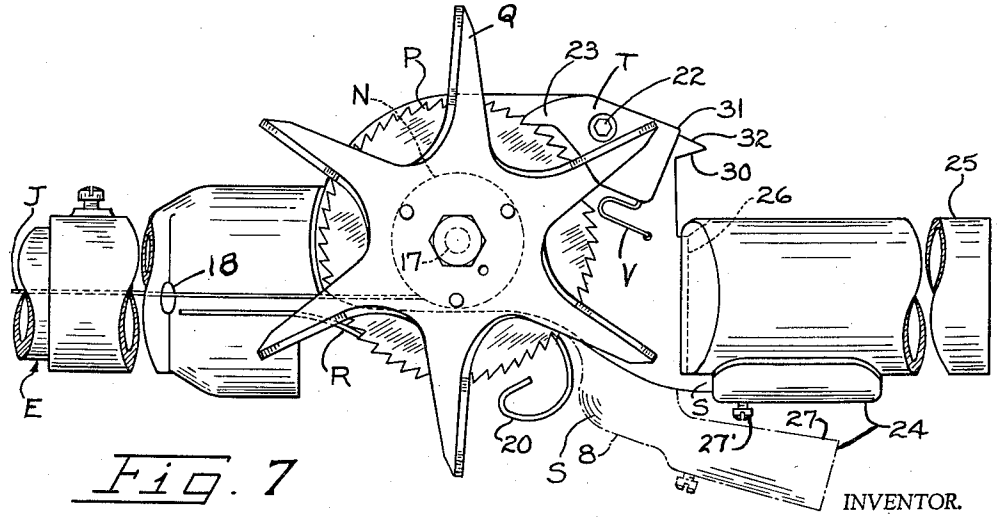


Fig. 7

INVENTOR.
ROBERT G. AMES
BY
Munn & Liddy
ATTORNEYS

United States Patent Office 3,070,827 Patented Jan. 1, 1963

3,070,827

MASTIC APPLYING TOOL

Robert G. Ames, Hillsborough, Calif., assignor of one-fourth to Stanley Ames, Belmont Calif., one-sixth to Mrs. Katherine W. Berryman, one-sixth to Mrs. Lois W. Rosebrook, and one-sixth to George W. Williams III, all of Hillsborough, Calif.

Filed Sept. 18, 1961, Ser. No. 138,876
6 Claims. (Cl. 15—555)

The present invention relates to improvements in a mastic applying tool and it consists in the constructions, operations and advantages hereinafter described and claimed.

In the use of tools for applying mastic to wall board joints as disclosed in my Patents No. 2,711,098, No. 2,809,513, No. 2,824,442, No. 2,889,699, and No. 2,889,965, considerable force is required to compress the mastic-holding compartment for forcing mastic from the compartment and onto the wall board joint. The operator must not only hold the tool body against the wall board by means of the tool handle, but in addition he must exert sufficient force on the handle for causing it to move a mastic-expelling plate into the mastic-holding compartment for forcing the mastic from the compartment.

In my copending application on a mastic-feeding tool with compressible mastic-holding compartment, filed July 10, 1961, Serial No. 123,015, I disclose novel means on the tool handle which may be actuated by the operator for swinging a plate in the mastic-holding compartment and ejecting mastic therefrom for applying the mastic on a wall board joint. A cable is used for the purpose and one end is wrapped around a drum which is mounted on the handle. The drum can be rotated by the operator with less force than that required for pressing on the handle for swinging the plate. Therefore the tool is easier to operate.

In the present invention, I provide a different type of mastic-holding compartment from that shown in the above-mentioned copending application. The compartment is cylindrical and is movable with respect to a stationary piston. The piston is supported by the tool handle in a novel manner and a cable is used for moving the cylinder with respect to the piston for causing the latter to force mastic from the cylinder. The mastic outlet for the cylinder includes a spherical member that can receive snap-on heads of different types for different purposes.

The present tool is designed to permit the tool head to be applied to a room corner and the design of the tool and its handle is such that the greatest amount of pressure from the handle will be directed at the tool head regardless of the particular angle the axis of the mastic-holding cylinder may make with the wall board surface on which the mastic is being applied.

Another object of the invention is the change in the mechanism on the handle for winding the cable on the drum for forcing mastic from the cylinder and the release of the drum from a holding device when the operator wants to relieve pressure from the cylinder. In my copending case, above mentioned, the drum is rotated by a handwheel. In the present case, a rockable arm is added for stepwise rotating the drum.

Other objects and advantages will appear as the specification continues. The novel features of the invention will be set forth in the appended claims.

Drawings

For a better understanding of my invention, reference should be had to the accompanying drawings, forming part of this specification, in which:

FIGURE 1 is a side elevation of the device showing the cylinder filled with mastic;

FIGURE 2 is an enlarged showing of a mastic applying tool head applied to the conical end of the mastic holding cylinder;

FIGURE 3 is a longitudinal sectional view through the device, portions being shown in elevation;

FIGURE 4 is a transverse section taken along the line 4—4 of FIGURE 3;

FIGURE 5 is a side elevation of the portion of the tool handle that carries the cable-receiving drum and its actuating mechanism;

FIGURE 6 is a top plan view of FIGURE 5; and

FIGURE 7 is a side elevation taken by rotating the handle and cable-receiving drum of FIGURE 5 180° about the longitudinal axis of the handle.

While I have shown only the preferred form of my invention, it should be understood that various changes, or modifications, may be made within the scope of the annexed claims without departing from the spirit thereof.

Detailed Description

In carrying out my invention, I provide a cylinder A, see FIGURE 1, that is closed at one end by a cover B. The cover has a hollow conical portion **1** communicating with a ball-shaped mastic outlet **2**. A mastic-applying corner head X is removably secured to the ball-shaped outlet **2**. In FIGURE 7 of my patent on a mastic applicator with removable heads, No. 2,889,699, issued June 9, 1959, I show a member with a similar hollow conical portion for receiving mastic from a compressible compartment. The conical portion has a ball-shaped or partial spherical end that communicates therewith and a mastic-applying corner head may be removably secured to the spherical end to receive mastic therefrom and to apply it to a room corner. The structural details of the mastic-applying corner head shown in FIGURE 7 of Patent No. 2,889,699 are fully disclosed in my Patent No. 2,824,443, issued February 25, 1958. Other types of mastic-applying heads may be snapped onto the ball-shaped mastic outlet **2** in the present case. The mastic applying head X is shown diagrammatically in FIGURE 1 and more in detail in FIGURE 2.

A piston C, see FIGURE 3, is slidably mounted in the cylinder and it is carried by a U-shaped frame D, that has a long arm **3**, received in the cylinder, a short integral portion **4** that extends at right angles to the long arm **3** and projects through and is slidably received in a slot **5** in the cylinder A, and an integral second long arm **6**, that parallels the long arm **3**, but lies outside of the cylinder A. The second long arm **6**, has its free end rigidly secured at **7**, to one end of an elongated handle E. The long arm **3** carries a plate **8** that has two pairs of lateral extensions **9—9** on which guide rollers F are rotatably mounted to contact with the inner surface of the cylinder A, and guide it when the cylinder is moved along its longitudinal axis in a manner to be described hereinafter. One pair of guide rollers F contact with the cylinder A at points 180° removed from the other pair of guide rollers F.

In FIGURE 4, the plate **8** is shown having a pair of transversely extending plates **10—10**, connected thereto and projecting at right angles to the plate **8**.

Guide rollers F′ are rotatably mounted on the transversely extending plates **10—10** and they contact with the inner surface of the cylinder A, at points 90° removed from the first-mentioned pairs of guide rollers F. The four rollers F, and the four rollers F′, support the cylinder A, and guide it in its movement with respect to the stationary piston C. The slot **5** in the cylinder A, lies between the rollers F and F′ so the rollers will clear the slot. The piston C has a cup-shaped washer **11** facing

forwardly in the cylinder and a disc **12** holds the washer in place.

The cover B, is provided with a mastic loading valve H, see FIGURE 3. The cover has a cylindrical inlet **13** and a spring-pressed valve **14**, is mounted in the inlet and normally closes it. When a mastic feed pipe, not shown, is connected to the inlet **13**, and mastic G, under pressure, is forced through the feed pipe and into the inlet **13**, the valve **14** will be opened and permit the mastic to enter the cylinder A and to move the cylinder with respect to the stationary piston C, as the cylinder is filled. The filling operation is terminated before the piston uncovers the longitudinal slot **5** in the cylinder A. The spring biased check valve **14** will close when no more mastic is forced through the loading valve H.

I will now describe the means for moving the cylinder A with respect to the stationary piston C for forcing mastic from the cylinder and out through the spherical portion **2** and into a mastic-applying head X, that has a universal connection with the spherical portion **2**. A cable J has one end connected to the center of a diametrically extending rod **15** provided at the front end of the cylinder A. The cable extends through a central opening **16** in the piston C and therefore the cable will be aligned with the axis of the cylinder A. The opening **16** may be rubber lined to permit passage of the cable J, but prevent mastic passing through the opening. An idler pulley K, is rotatably mounted on the U-shaped frame D, and the cable J is passed around it. A second idler pulley L is rotatably mounted on the frame D and receives the cable J. A third idler pulley M is mounted where the frame D connects with the handle E, and the cable is passed around the idler M and will be axially aligned with the handle axis.

The cable J then extends to a drum N and has its free end connected to the drum. The details of the operating mechanism for the drum are shown in FIGURES 5, 6 and 7. The handle E has an axle **17** upon which the drum N, is rotatably mounted. A ratchet P, is secured to the drum and rotates therewith as a unit. FIGURE 6 shows the ratchet P secured to one side of the drum N, and a handwheel Q, secured to the other side. FIGURE 7 shows the cable J extending through an opening **18** in the handle E and then being secured to the drum N. The handwheel Q can be manually rotated for winding the cable J on the drum N.

The drum is held in the position into which it has been rotated by a leaf spring R that is pivotally secured to the handle E by a cap screw **19**. The leaf spring R is normally in the full line position shown in FIGURE 6 so that the leaf spring will engage with the teeth of the ratchet P and permit counterclockwise rotation of the ratchet when looking at FIGURE 7, but prevent clockwise rotation. The leaf spring R has a rounded hand gripping end **20** by means of which the leaf spring can be swung from the full to the dot-dash line position in the direction of the arrow **21**, shown in FIGURE 6. This swinging movement of the leaf spring R in a lateral direction about the pivot **19**, frees it from the ratchet P and permits the drum to rotate in either direction.

I also provide novel means for step-wise advancing the drum N to wind the cable J thereon. An arm S, is rockably mounted on the shaft **17** and a spring-biased pawl T, is pivotally mounted on the arm S at **22**. A spring V is connected to the handle S and bears against the pawl T for urging the pointed end **23** in yielding engagement with the teeth on the ratchet P, see FIGURE 7. The arm S, has a hand portion **24** that can be manually moved toward the hand grip portion **25** for swinging the arm about its pivot **17**, and moving the pawl T for rotating the ratchet P through a predetermined arc in a counterclockwise direction in FIGURE 7. A slot **26** in the tubular hand grip portion **25** receives the flat portion **27** of the hand portion **24**. An adjustable cap screw **27'**, carried by the hand portion **24**, strikes the tubular hand grip **25** and limits the swinging movement of the arm S.

A coil spring U, see FIGURE 5 is connected at one end to a pin **28** mounted on the arm S, and is connected at its other end to a screw **29**, secured to the handle E. The coil spring U, returns the arm S to its starting or initial position and this is when a stop **30**, see FIGURE 7, on the arm contacts with the handle E. The leaf spring R engages with the teeth on the ratchet P to prevent clockwise rotation of the ratchet in FIGURE 7, while the pawl T rides over the ratchet teeth as the arm returns to starting position. The pawl T has a portion **31** projecting beyond the adjacent edge **32** of the arm S and a pressing on the portion **31** will free the pawl from the ratchet for a purpose presently to be described, see FIGURES 5 and 7.

Operation

From the foregoing description of the various parts of the device, the operation thereof may be readily understood. The operator first fills the cylinder A with mastic by applying a mastic feed pipe, not shown, to the mastic loading valve H. As the mastic is forced into the cylinder A, the cylinder will be moved toward the left in FIGURE 1 because the mastic will be received between the stationary piston C and the cylinder cover B. When the desired amount of mastic has been forced into the cylinder, the feed pipe is disconnected from the loading valve H and the spring-biased check valve **14** will close. During the filling of the cylinder with mastic, the drum N has been freed so that the cable J can feed from the drum as the cover B is moved away from the piston C and carries the adjacent end of the cable J therewith. The drum N is freed by the operator swinging the leaf spring pawl R from the full to the dot-dash line position shown in FIGURE 4 and this will free the leaf spring R from the ratchet P. The other spring biased pawl T is manually held out of engagement with the ratchet P by the operator pressing on the portion **31** of the pawl T, that extends beyond the edge **32** of the arm S, whereby the pointed end **23** of the pawl will be freed from the ratchet P. FIGURES 1, 3 and 4 show the cylinder A being provided with a stop **40** and the U-shaped frame D carries a screw **41**, that strikes the stop and prevents further movement of the cylinder A with respect to the piston C, when the piston nears the inner end of the slot S. The screw **41** can be backed away from the stop **40** by rotating the screw so that the frame D may be removed from the cylinder A for inspection if desired.

The tool, when filled with mastic, is now ready to be used. The handle E is provided with a hand grip sleeve W which may be moved along the handle and then secured in the desired position by tightening a set screw **33**. The operator grasps the hand grip sleeve W with his left hand and then grasps the hand grip portion **25** of the handle E with his right hand. He then moves the leaf spring pawl R back to the full line position shown in FIGURE 6 so that the leaf spring will engage with the ratchet P and prevent clockwise rotation when looking at FIGURE 7. He then rotates the drum N for winding the cable J thereon either by rotating the hand wheel Q or reciprocating the arm S one or more times for stepwise advancing the ratchet P and thed rum N for winding the cable J on the drum.

The operator continues winding the cable J on the drum N until he sees that mastic has started to be forced from the cylinder A through the conical portion **1** and into the tool head X. The tool is now raised by the operator so that the tool head X will contact with the surface Y that is to receive the mastic. The desired pressure on the mastic in the cylinder A for moving the mastic to the tool head X can be applied by the operator by simply manipulating the arm S. The movement of the arm toward the hand grip portion **25** will cause the pawl T, see FIGURE 5, to rotate the ratchet P counter clockwise through an arc and to rotate the drum N in the same di-

rection through a similar arc for winding a portion of the cable J onto the drum. When the operator releases the arm S, the spring U, see FIGURE 3, will return the arm to its initial position. During this return movement, the leaf spring pawl R will hold the ratchet P from rotating in a clockwise direction in FIGURE 7 and the spring biased pawl T will have its pointed end 23 ride over the ratchet teeth into a new position on the ratchet. The operator can watch as he manipulates the tool and see that a constant pressure on the mastic in the cylinder A is applied by the piston C due to the cable J tending to move the cover B toward the stationary piston C. This pressure can be considerably greater than that which could be applied by the operator by merely pressing on the handle E with a force sufficient to cause the tool head X to bear on the supporting surface and move the cover B toward the piston C. The pull of the cable J on the cover B will be along the axis of the cylinder A and this is irrespective of the angle which the handle E makes with the long arm 6 of the U-shaped frame D. The bolt 7 connects the handle E with the long arm 6 and this bolt may be tightened after the operator has determined the proper angle the handle will make with the long arm 6. The placement of the pulleys K, L and M on the U-shaped frame D, is such that the angle of the handle E can be adjusted with respect to the long arm 6 and this will have no effect upon the pull of the cable J on the cover B. This pull will be in line with the axis of the cylinder A at all times. The bolt 7 rotatably supports the pulley M.

It is important to note that the connection between the handle E and the long arm 6 of the U-shaped frame D is placed near the point where the tool head X communicates with the spherical joint 2, see FIGURE 3. By this arrangement the operator can apply force to the tool head X at a point adjacent to the tool head and this is true whether the cylinder A is filled with mastic or is almost completely empty of mastic. The cylinder A will move approximately four or five inches along its length from the time the cylinder is filled wtih mastic to the time it is practicaily empty. FIGURE 1 shows the cylinder A filled with mastic. Of course, when the cylinder is nearly empty of mastic, the handle connection with the long arm 6 will be as near as possible to the tool head X. The cylinder guide rollers F and F' will guide the cylinder A along its axis in its movement. The tool will be practically balanced on the handle E whether full or empty because the additional weight of the mastic when the tool is full will be placed near the connection 7 that joins the handle with the long arm 6. A balanced tool is much easier for the operator to handle. The greatest moment of force is applied substantially at the tool head X for maintaining the head in contact with the mastic-receiving surface when the operator presses on the handle E for moving the tool head over the surface whether the cylinder A is filled with mastic or just about empty.

It is possible to rotate the cover B through an arc of 180° with respect to the longitudinal axis of the cylinder A and this will position the conical portion 1 diametrically opposite to the position shown in FIGURE 1. This will also bring the tool head X closer to the end of the handle E that is connected to the long arm 6. In certain instances it may be advisable that this change be made for a better operation of the tool.

I claim:

1. In a mastic applying tool; a mastic holding cylinder; a cover closing one end of the cylinder and having an outlet for mastic; a piston slidably mounted in the cylinder; a frame connected to the piston and extending outside of the cylinder and having a terminal portion disposed near the mastic outlet in the cover; a mastic applying head communicating with the mastic outlet; a handle having one end connected to the said terminal portion of the frame; means mounted on the frame for guiding the cylinder in the direction of its longitudinal axis and with respect to the piston; and means for moving the cylinder for shortening the distance between the piston and cover; whereby mastic is forced from the cylinder and through the outlet in the cover.

2. The combination as set forth in claim 1: and in which the means for moving the cylinder comprises a cable having one end connected to the cover; said piston having an opening through which the cable extends; a drum on the handle for winding the other end of the cable thereon; and cable guide means on the frame and handle for guiding the cable; said drum, when rotated, winding the cable thereon and pulling on the cover for moving it and the cylinder with respect to the piston; whereby the piston will force mastic from the cylinder through the mastic outlet and mastic applying head.

3. In a mastic applying tool; a mastic holding cylinder; a cover closing one end of the cylinder and having an outlet for mastic; a piston slidably mounted in the cylinder; a U-shaped frame having the end of one long arm disposed in the cylinder and connected to the piston for supporting it; the cylinder having a slot for slidably receiving the short portion of the frame disposed between the two long arms for disposing the other long arm exteriorly of the cylinder; a plurality of guide rollers mounted on the frame and adjacent to the piston for guiding the cylinder movement with respect to the piston and along the cylinder axis; the said other long arm paralleling the cylinder axis and extending toward and terminating adjacent to the cover; a handle connected to the end of said other arm; and means for moving the cylinder with respect to the piston for causing the latter to force mastic out through the outlet in the cover.

4. In a device of the type described; a handle; an axle carried by the handle; a drum rotatably mounted on the axle and having a cable wound thereon; a ratchet rotatable as a unit with the drum; an arm rockably pivoted on the drum axle and having a hand portion movable toward and away from said handle; a spring connected to the arm and handle for yieldingly swinging the arm about the axle for moving the hand portion away from the handle; said arm having a stop engageable with said handle for preventing further movement of the arm by the spring when the hand portion is at a predetermined distance from the handle; a spring-biased pawl mounted on the arm and engageable with said ratchet for rotating it and the drum for winding the cable thereon when the hand portion of the arm is manually moved toward the handle; a ratchet-holding leaf spring pivotally carried by the handle and engaging with the ratchet for holding it in the position into which it has been rotated by said pawl; said pawl freely moving over the ratchet teeth as the arm is returned to its initial position by the spring which is when the stop strikes the handle; said leaf spring being manually swingable laterally about its pivot to free it from the ratchet and the pawl being manually swingable to free it from the ratchet when it is desired to free the ratchet and drum and permit the drum to rotate to unwind the cable therefrom.

5. The combination as set forth in claim 4: and in which the hand portion of the arm carries an adjustable stop for contacting with the handle for varying the arc of swing of the arm.

6. The combination as set forth in claim 4: and in which a hand wheel is operatively connected to said drum for manually rotating the drum independently of the arm; said ratchet teeth freely moving past the pawl and leaf spring during the rotation of the wheel and drum.

No references cited.