

Feb. 21, 1950

A. G. MONSON
GROMMET SETTING MACHINE HAVING
GROMMET FEEDING MECHANISM

2,497,899

Filed July 31, 1946

2 Sheets-Sheet 1

Fig. 1

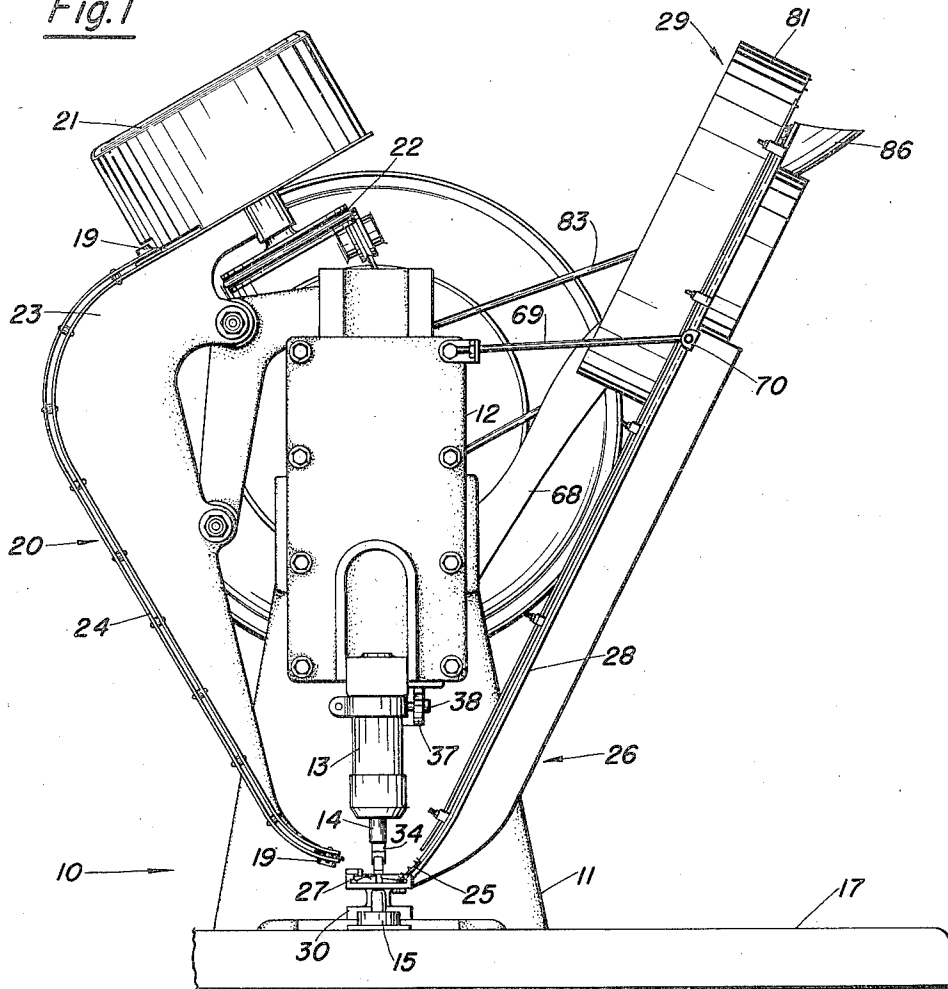


Fig. 2

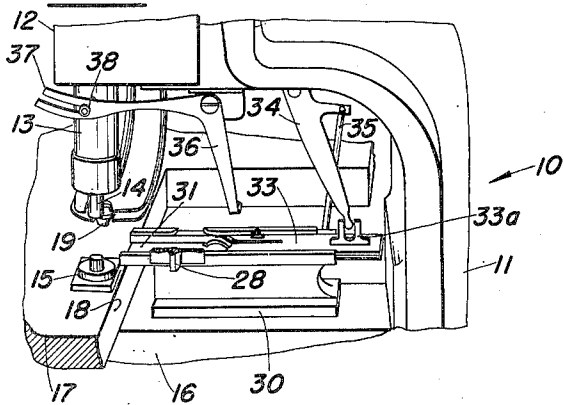
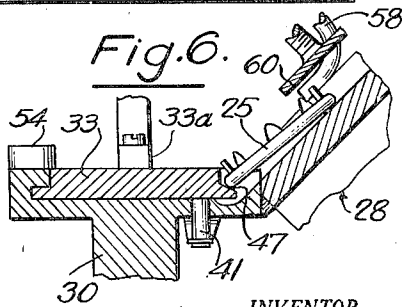


Fig. 6.



INVENTOR.

AUBREY G. MONSON

BY

M. Hayes

ATTORNEY

Feb. 21, 1950

A. G. MONSON
GROMMET SETTING MACHINE HAVING
GROMMET FEEDING MECHANISM

2,497,899

Filed July 31, 1946

2 Sheets-Sheet 2

Fig. 3

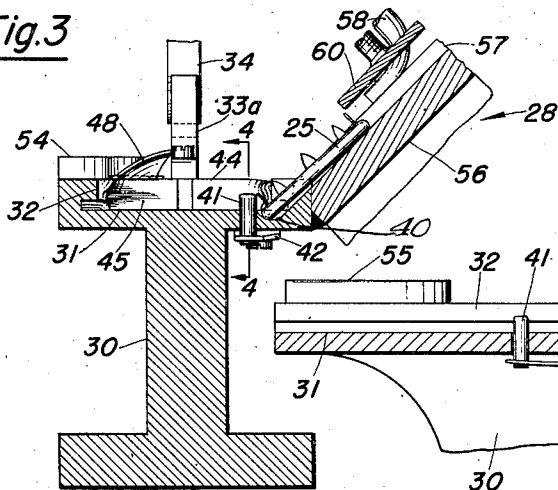


Fig. 4

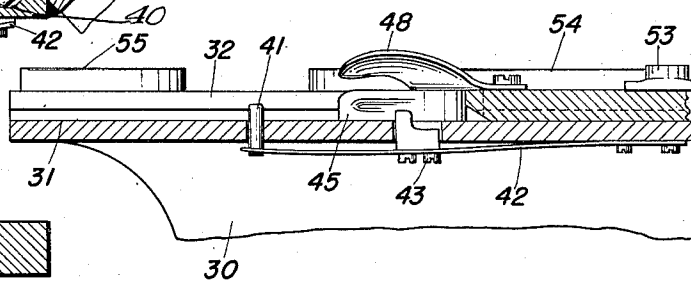
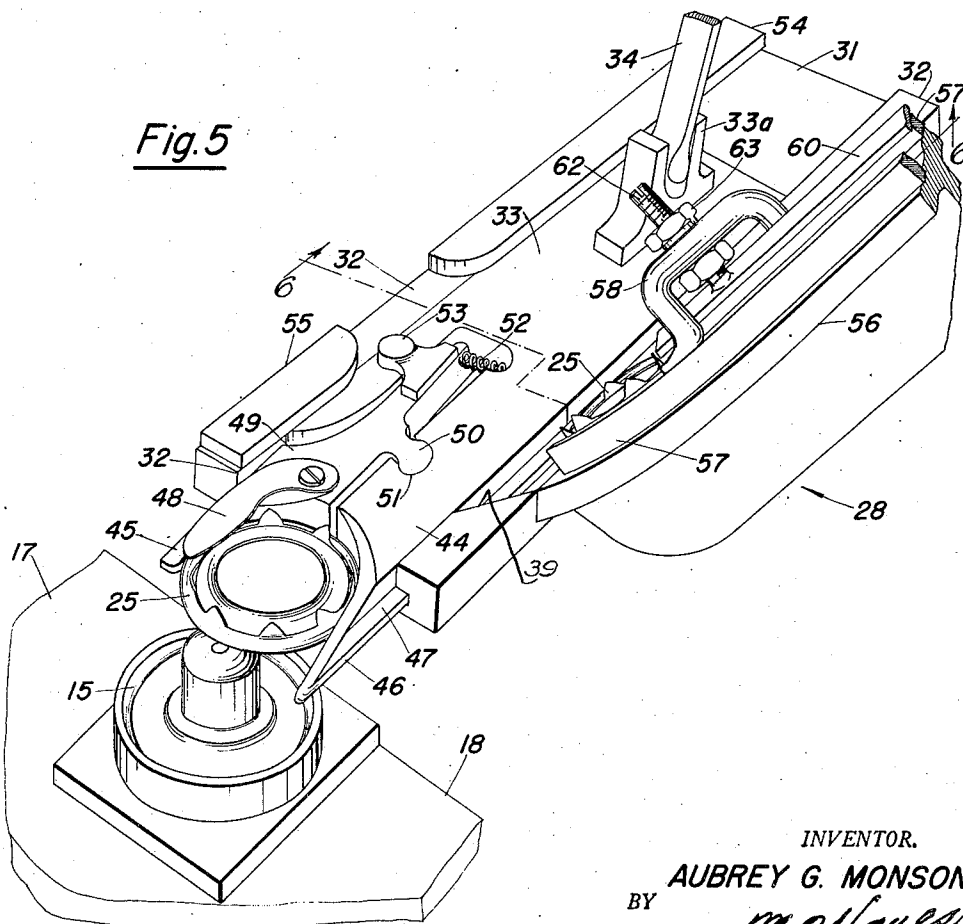


Fig. 5



INVENTOR.
AUBREY G. MONSON
BY *McLay*
ATTORNEY

UNITED STATES PATENT OFFICE

2,497,899

GROMMET SETTING MACHINE HAVING
GROMMET FEEDING MECHANISM

Aubrey G. Monson, Bremerton, Wash.

Application July 31, 1946, Serial No. 687,499

3 Claims. (Cl. 218-6)

(Granted under the act of March 3, 1883, as
amended April 30, 1928; 370 O. G. 757)

1

This invention relates to grommet setting machines and more particularly to automatic feeding mechanisms.

An object of the invention is to provide an improved mechanism for automatically feeding washers to a grommet setting machine so as to eliminate the necessity of manually feeding the washers.

Other objects of the invention are to provide an improved feeding mechanism of such construction as to selectively feed washers to the dies of a grommet setting machine in the desired sequence of operation so as to increase the output of said machine; to provide an improved feeding mechanism adapted to deliver a washer directly to one of the dies of a grommet setting machine and arranged so as to be inoperative during the operation of said dies; to provide an improved mechanism, of the character described, having reciprocal means for receiving washers and feeding the same to one of the dies of a grommet setting machine intermittently of the operation of the dies thereof so as to render such operation more completely automatic; and to provide improved elements and arrangements thereof in a mechanism of the character described and for the purposes set forth.

In accomplishing these and other objects of the present invention, I have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawings, wherein:

Fig. 1 is a front elevational view of a grommet setting machine having a feeding mechanism, embodying the features of the present invention, mounted thereon.

Fig. 2 is a detail perspective view of a portion of the machine, showing the shuttle of the mechanism in its retracted, inoperative position and its relation to the dies of said machine.

Fig. 3 is a transverse, vertical, sectional view of the retracted shuttle, and a portion of the conveyor track.

Fig. 4 is a longitudinal, sectional view of a portion of the shuttle, taken on the line 4-4 of Fig. 3.

Fig. 5 is an isometric view, showing the shuttle in its ejected position immediately prior to depositing a spur washer on the male die of the machine.

Fig. 6 is a transverse, vertical, sectional view taken along the line 6-6 of Fig. 5.

Referring more in detail to the drawings:

In Fig. 1, the numeral 10 designates a grommet setting machine, of conventional construc-

2

tion, which includes an upright frame or pedestal 11 having a forwardly-projecting head 12 at its upper end. A vertically-reciprocable plunger 13 is carried by the head 12 and has a female die 14 formed at its lower end for coacting with a stationary male die 15. The latter is mounted on an anvil block 16 which is supported by and extends laterally from the pedestal 11 in underlying relation to the head (Fig. 2). A suitable work table or bench 17, having a recess 18 formed in the rear edge portion thereof, is disposed forwardly of the machine 10 with the anvil block 16 disposed below the recess and the male die 15 projecting upwardly through the table.

Although not illustrated, the coaction of the dies is adapted to form reinforced eyes in canvas or other fabric (not shown) by cutting openings therein and setting metallic grommets in surrounding relation to the openings. These grommets have associated therewith coacting spur washers which have been shown as annular, but which may be of any desired shape. Annular, metallic elements 19, commonly known per se as grommets, are fed to the female die 14 by a suitable apparatus 20 which includes a selecting or sorting drum 21, rotated by a belt drive 22, and a pivoted arm 23 having a conveyor track 24 mounted thereon for conducting the grommets from the drum to said female die. The arm 23 is adapted to be momentarily pivoted inwardly upon downward reciprocation of the female die so as to dispose the lower extremity of the track 24 below said die to permit said die to be threaded into the grommet, whereby, upon return movement of the arm 23, the lowermost grommet 19 is withdrawn from said track. The above described elements are more or less conventional and, per se, form no part of the present invention.

Spur washers 25 have heretofore been placed manually on the male die 15 below the canvas so as to be engaged with the annular grommet 19 upon downward reciprocation of the female die 14. In order to eliminate this manual handling of the spur washers 25, an automatic feed mechanism 26 has been provided and includes a shuttle 27 (Figs. 1-5), a chute or conveyor track 28 (Fig. 1) and a selector or sorter 29 (Fig. 1). The spur washers discharged by the selector 29 are conveyed by the track 28 to the shuttle 27 which is adapted to feed said washers singly to the male die 15.

As is most clearly shown in Figs. 2 and 3, the shuttle 27 includes a horizontal base or support 30 in the form of an I-bar which extends longitudinally of the anvil block 16 and is suitably

3

secured thereto. A co-extensive guide way or channel 31 is formed in the upper surface of the shuttle base 30 to provide inwardly-directed, overhanging side rails 32 for slidably confining a shuttle plate 33 upon said base. The plate 33 is adapted to be reciprocated relative to the base by an arm 34 which is pivotally suspended from the head 12 and has its lower end engaging within a U-shaped bracket 33a carried by said plate (Figs. 2 and 5). An actuating rod 35 is connected to the arm 34 for pivoting the same so as to reciprocate the shuttle plate, which rod is preferably spring-pressed (not shown) so as to maintain said plate in its retracted or rearward position.

For preventing reciprocation of the shuttle plate and rendering the same inoperative upon operation of the plunger 13 and its die 14, an angular lever 36 is pivotally suspended from the head 12 intermediate said plunger and the arm 34 (Fig. 2). One leg of the lever 14 projects forwardly and has a curved, outer extremity 37 which is bifurcated or slotted so as to be adjustably connected to the plunger by a suitable screw 38. The lever has its other leg depending substantially vertical whereby downward movement of the plunger, which pivots said lever in a counter-clockwise direction, swings the depending lever leg rearwardly into the path of forward movement of the arm 34 so as to prevent forward reciprocation of the shuttle plate during downward movement of the plunger 13. In the event that the shuttle plate is in its forward or projected position upon downward movement of the plunger, said plate is retracted by counter-clockwise pivoting of the lever.

As is most clearly shown in Figs. 3 and 5, one of the side rails 32 of the shuttle base 30 is cut away or recessed adjacent its forward end, as at 39, for providing a continuation of the upper surface of the lower end of the conveyor track 28. An arcuate depression or sump 40 is formed in the bottom of the guide channel 31 adjacent the recess 39 for receiving and supporting a spur washer 25 discharged by the conveyor track as shown in Fig. 3. To prevent accidental displacement of the supported spur washer, a depressible stop pin 41 projects upwardly through the base 30 and is resiliently maintained in such position by a flat spring 42 which longitudinally underlies and is suitably secured to the underside of the upper portion of said base (Fig. 4). The stop pin is adapted to be retracted upon forward reciprocation of the shuttle plate 33 by means of an actuating lug or dog 43 which is carried by the spring 42 rearwardly of said pin and which projects upwardly through the base into the guide channel 31, whereby the forwardly moving plate engages and depresses the dog to flex said spring and retract the pin.

Gripping means in the form of coacting jaws or gripping elements 44 and 45 are carried by the forward end of the shuttle plate for engaging the supported spur washer 25 and ejecting or feeding the same to the male die 15 upon forward movement of said plate. As is most clearly shown in Fig. 5, the jaws are curved complementary to the spur washer. The right-hand jaw 44 is preferably made integral with the plate 33 and has a forwardly-extending tapered portion or finger 46 for engaging beneath the supported spur washer and lifting the same out of the sump 40, whereby said washer slides over the finger into the guide channel 31 between the jaws. Simultaneously, the lower end of the

4

conveyor track 28 is closed by the marginal edge of the plate 33, which may be bevelled as shown in Fig. 6 at the numeral 47, to maintain the adjacent washer within said track until retraction of said plate.

The left-hand jaw 45 is complementary to the jaw 44 and has an overhanging flange or guard 48 secured thereto for preventing displacement of the spur washer fed to said jaws (Figs. 3 to 5). For pivotally connecting the jaw 45 to the shuttle plate, an arm 49 extends rearwardly from said jaw and has a preferably integral hinge pin or element 50 which is confined within a suitable socket 51 formed in said plate. The rear end of arm 49 is constantly urged outwardly by a coiled or helical spring 52 so as to maintain the jaw 45 pivoted toward the jaw 44 for gripping the spur washers. Actuation of the pivoted jaw is controlled by the coaction of a cam riser or follower 53, carried by the arm 49, and longitudinal cam bars or members 54 and 55 which are mounted on the left-hand side rail 32. The cam members 54 and 55 extend longitudinally of the side rail and are spaced apart from each other opposite the conveyor track 28 so as to permit closing of the jaws and gripping of the spur washers during ejection thereof. As long as the cam follower 53 is engaging one of the cam members, the jaws remain open for receiving and releasing the spur washers.

The conveyor track 28 includes an elongated base member 56, preferably in the form of a T-bar, which extends from the selector 29 into abutment with the right hand side rail 32 with the upper face of base member 56 flush with the face of the recess 39 formed in the right-hand side rail 32 of the shuttle base 30 (Figs. 1-3). Co-extensive guide rails 57 extend along the longitudinal margins of the base member 56 for preventing lateral displacement of the spur washers and are secured to said base member by suitable screw-secured brackets 58. For positioning the retaining strip 60 in spaced relation to the base member, each bracket 58 receives a stud 62 carried by and projecting perpendicularly from said strip. Suitable nuts 63 maintain the stud 62 in a fixed position relative to the bracket 58.

The upper end of the conveyor track 28 communicates with the selector 29. The selector 29 is fixed to base 11 by means of an inclined arm 68, and also by means of a rod 69 and bracket 70. The selector is so called because it will select for feeding to the conveyor track 28 only those spur washers that are lying spur upward within the selector whereby the washers can be fed to the track 28 spur upward. The selector includes a rotatable drum 81 that is actuated by means of a drive belt 83. The spur washers to be fed to the track 28 are inserted into the drum 81 by means of inlet 86. It will be apparent that the stirring of the washers within the rotating drum will result in the turning over of the rejected washers and that all washers in the selector will quickly be presented to the track spur upward.

Operation

The operation of a feeding mechanism constructed as described is as follows:

A quantity of spur washers 25 are manually inserted in the hopper through the inlet 86. Since the drum 81 is constantly rotated by the belt 83, the washers are quickly and sequentially presented spur upward to the track 28, and then slide down said track to the shuttle 27. Further travel of the washers is halted by the lowermost

5

or initial washer engaging within the sump 40 and by the coaction of the depressible pin 41 of the shuttle base 30 (Fig. 3).

Upon actuation of the rod 35 (Fig. 2), as by the foot of the operator, the arm 34 is swung clockwise so as to slide the shuttle plate 33 forwardly or to the left. The tapered finger 46 of the stationary jaw 44 engages beneath the lowermost spur washer and the depressible pin 41 is depressed upon forward reciprocation of the shuttle plate (Figs. 3 and 4), whereby said washer slides between the jaws 44 and 45. Due to the coaction of the cam follower 53 and the cam member 54, the pivoted jaw is open during this movement of the plate and the washer to permit this sliding of the washer between the fingers 45 and 46. Continued movement of the shuttle plate results in follower 53 passing beyond cam plate 54, as shown in Fig. 5, so that the jaw 45 is pivoted inwardly to grip the washer, by the force of the spring 52 bearing against the arm 49 of said jaw, to hold the washer during forward movement of fingers 45 and 46 beyond the forward end of channel 31. As soon as the follower engages the cam member 55, which takes place as the washer gets above die 15, the pivoted jaw commences to move away from the stationary jaw so as to release the washer gripped there-between and drop the same onto the male die 15.

Release of the actuating rod 35 results in retraction or inward reciprocation of the shuttle plate and the feeding of the next or adjacent spur washer to the depression 40 (Fig. 3). With a spur washer supported upon the male die, the machine is actuated in the conventional manner, upon the operator tripping a one revolution clutch, to set a grommet in canvas or other fabric (not shown). As has been explained, downward reciprocation of the plunger 13 and its female die 14 pivots the angular lever 36 in a counter-clockwise direction so as to prevent accidental forward movement of the shuttle plate (Fig. 2) during said downward movement or so as to return the shuttle plate if it is already improperly in its forward position.

While I have shown but one embodiment of my invention, it is susceptible to modification without departing from the spirit of the invention. I do not wish, therefore, to be limited by the disclosures set forth, but only by the scope of the appended claims.

6

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

I claim:

1. A washer feeding mechanism including, a support, conveyor means for discharging washers upon the support, a shuttle plate slidably mounted on the support, means for reciprocating said plate, spring-pressed jaws carried by said plate for engaging and gripping individual washers upon outward reciprocation of said plate, and coacting cam means mounted on said support and plate for actuating the jaws and arranged so as to permit opening of said jaws for alternately receiving the washer and releasing the same.

2. A mechanism for feeding workpieces such as washers and the like including a support; means carried by said support for delivering workpieces to a work station, said means being movable to and fro relative to said support through a cycle including a forward stroke from a retracted position toward said work station and a return stroke in a direction from the work station toward said retracted position; jaws carried by said delivering means for gripping said workpieces and means operating at a time in said cycle prior to the beginning of the return portion thereof to open said jaws to release the workpieces at the work station.

3. The mechanism of claim 2 wherein last mentioned means comprises coacting cam and follower means on said support and said delivering means.

AUBREY G. MONSON.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,169,386	Engel	Jan. 25, 1916
1,579,487	Polinsky	Apr. 6, 1926
2,061,193	Gualtiere	Nov. 17, 1936
2,196,159	Bedford	Apr. 2, 1940
2,292,223	Hansen	Aug. 4, 1942
2,354,717	Treciokas	Aug. 1, 1944
2,390,066	Gookin	Dec. 4, 1945