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H. K. FOX

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AUTOMATIC THREAD CLIPPER FOR BAG END SEWING MACHINES

Filed Nov. 27, 1959

3 Sheets-Sheet 1

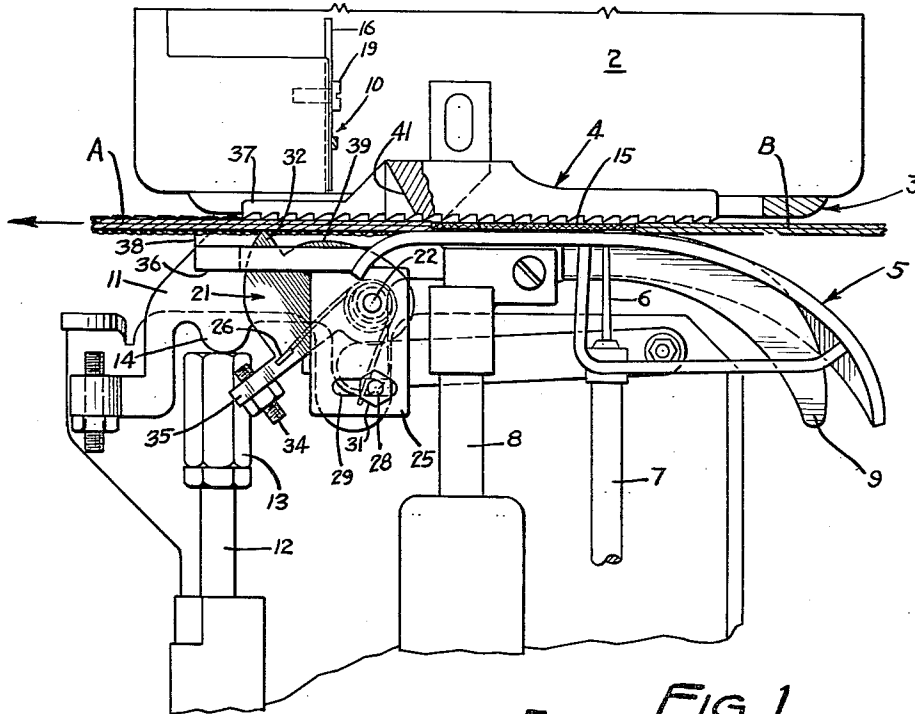


FIG. 1

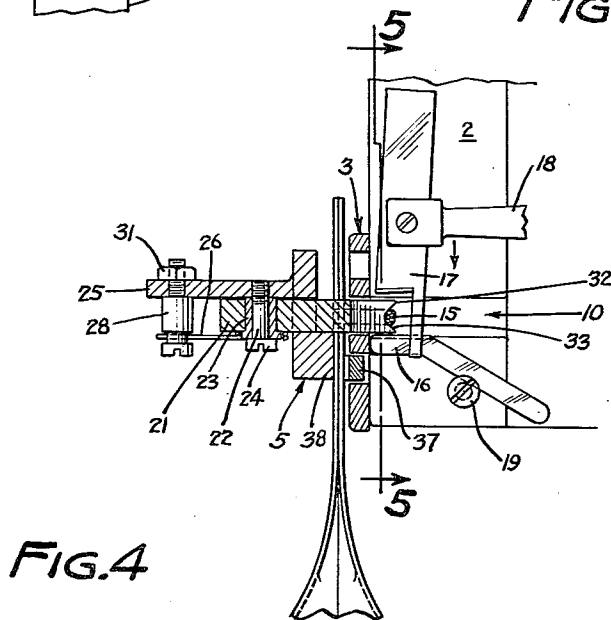


FIG. 4

INVENTOR.
HAROLD K. FOX
BY *Moore, White & Dard*
ATTORNEYS

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3 Sheets-Sheet 3

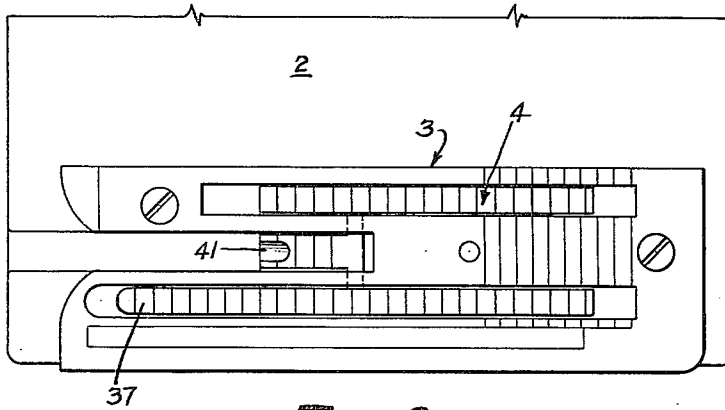


FIG. 6

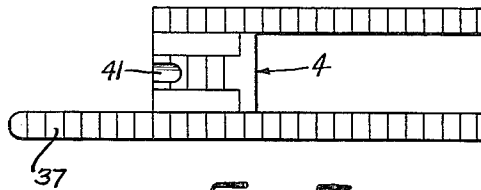


FIG. 7

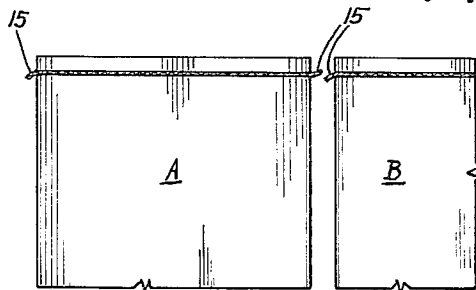


FIG. 8

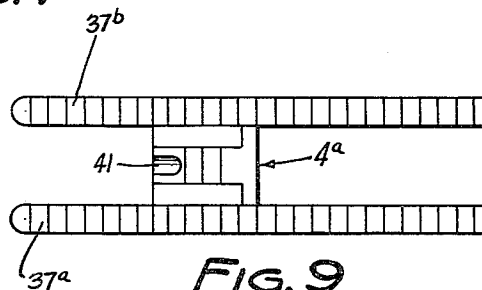


FIG. 9

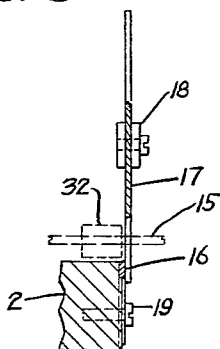


FIG. 5

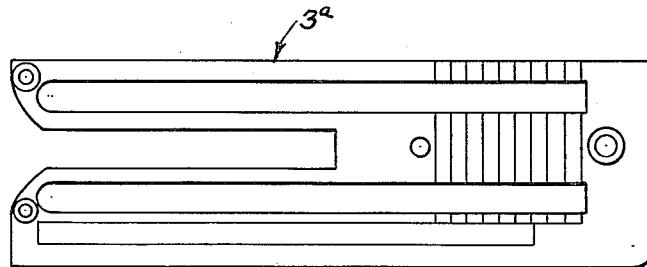


FIG. 10

INVENTOR.
HAROLD K. FOX
BY *Moore, White & Burd*
ATTORNEYS

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AUTOMATIC THREAD CLIPPER FOR BAG END SEWING MACHINES

Harold K. Fox, Minneapolis, Minn., assignor to Bemis Bro. Bag Company, Minneapolis, Minn., a corporation of Missouri

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4 Claims. (Cl. 112—11)

This invention relates to new and useful improvements in bag top sewing machines and more particularly to such machines including a continuously operating stitching mechanism wherein a chain of stitches connects adjacent bag tops, and which chain of stitches or thread must be cut or severed to free the bag tops from one another.

Conventional bag top sewing machines such as now in common use, usually require an operator to be stationed adjacent thereto to manually guide the chain threads between adjacent bag tops into a suitable thread cutting device located adjacent to the travel path of the bag tops. Such manual feeding of the chain threads into the thread cutter requires the bags to be spaced a considerable distance apart, usually from five to six inches, to permit ample time for the operator to guide each chain thread into the thread cutter without retarding the operation of the sewing mechanism. Such manual guiding of each chain thread into the thread cutter consumes time and, in addition, the relatively wider spacing between the bag tops, as they are progressively fed into the thread cutter, results in a reduction in the number of bag tops which may be sewn in a given length of time.

An important object of the present invention, therefore, is to provide an improved sewing mechanism for such bag top sewing machines which is entirely automatic and does not require the services of an operator for guiding the chain thread between bag tops into the thread cutting means, and whereby the spacing between adjacent bag tops as they are progressively fed through the sewing mechanism in rapid succession, may be reduced to a fraction of the spacing heretofore usually required between adjacent bag tops, when sewn in bag top sewing mechanisms of conventional construction, thereby resulting in relatively greater economy.

A further object of the invention is to provide in combination with a bag top sewing head comprising a continuously operating stitching mechanism for sewing the bag tops as they are progressively fed thereto and whereby a chain thread connects adjacent bag tops, of a continuously operating thread clipper located adjacent to one side of the travel path of the bag tops and having means associated therewith for engaging and guiding each chain thread out of its normal path of travel into the thread clipper whereby the chain threads between adjacent bag tops are automatically severed to free the bag tops from one another.

A further and more specific object of the invention resides in the novel construction of the thread clipper located at one side of the travel path of the bag tops, including a pivoted element located at the opposite side of the travel path and operable by traveling movement of the bag tops through the sewing head to traverse said travel path between adjacent bag tops and thereby guide each chain thread into cutting engagement with the thread clipper.

Other objects of the invention reside in the specific construction of the thread clipper whereby the chain threads between bag tops are not likely to become entangled with the projecting end of the stationary clipper blade, when guided into the thread clipper by the pivoted thread guide; in the construction of the pivoted thread

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guide with its bifurcated bag top engaging portion, said bifurcated portion being arranged to slidably engage each bag top under spring pressure and with its bifurcated terminal straddling the row of stitching applied to each bag top, said bifurcated terminal when becoming disengaged from the trailing end of each bag top, engaging the following chain thread and laterally guiding it into cutting engagement with the thread clipper; in the means provided for positively feeding each sewn bag top to a point beyond the thread clipper whereby the sewn bag top may momentarily hesitate in its forward movement, when the feed dog and presser foot become disengaged therefrom, such momentary hesitation of the sewn bag top causing a slackness in each chain thread thereby to facilitate quickly guiding each chain thread into the thread clipper; and in the simple and inexpensive construction of the thread clipper and bag feeding means.

These and other objects of the invention and the means for their attainment will be more apparent from the following description taken in connection with the accompanying drawings.

In the accompanying drawings there has been disclosed a structure designed to carry out the various objects of the invention, but it is to be understood that the invention is not confined to the exact features shown, as various changes may be made within the scope of the claims which follow.

In the drawings:

FIGURE 1 is a plan view of a portion of a bag top sewing machine showing the presser foot, feed dog and the needle, and showing two bags passing through the sewing head with the bifurcated terminal of the thread guide engaging a wall of one of the bag tops;

FIGURE 2 is a view similar to FIGURE 1, but showing the thread guide actuated to move a chain thread into cutting engagement with the thread clipper;

FIGURE 3 is a sectional plan view on the line 3—3 of FIGURE 2, showing the means for supporting the pivoted thread guide on the presser foot;

FIGURE 4 is a detail sectional view on the line 4—4 of FIGURE 2, showing the chain thread guide actuated to move a chain thread into position to be severed by the thread clipper, and also showing the unique construction of the stationary knife blade;

FIGURE 5 is a fragmentary sectional view on the line 5—5 of FIGURE 4, indicating in dotted lines the position of the pivoted thread guide and a chain thread, when said thread is moved into cutting engagement with the thread clipper;

FIGURE 6 is a front face view of the throat plate showing the position of the feed dog with relation thereto;

FIGURE 7 is a face view of the feed dog only;

FIGURE 8 is a view showing the relatively close spacing between adjacent bag tops made possible by the use of the novel thread clipper, herein disclosed, and showing the chain thread between the two bags severed;

FIGURE 9 is a view similar to FIGURE 7, but showing a feed dog having two vertically spaced forward extensions adapted to cooperate with similar extensions provided on the presser foot to facilitate moving the tops of textile bags through the sewing head; and

FIGURE 10 is a view similar to FIGURE 6 showing the form of throat plate utilized with the feed dog, shown in FIGURE 9.

In the selected embodiment of the invention herein disclosed, there is illustrated in the application drawings a portion of a sewing machine head, generally designated by the numeral 2, comprising a throat plate 3, a feed dog 4, a presser foot 5, and a reciprocating needle 6. The needle 6 is shown secured to an actuating bar or

rod 7, mounted for reciprocal movement, as is well known in the art.

The presser foot 5 is shown supported on spaced rods 8-8, best shown in FIGURE 3, and an actuator 9 is mounted adjacent to the presser foot 5 and has its opposite end 11 adapted to actuate a rod 12, which in turn actuates a micro switch (not shown) to start the sewing machine. An adjusting element 13 is shown secured to rod 12 adapted to directly engage a projection 14 on the actuating member 9, as best illustrated in FIGURES 1 and 2.

All of the above described elements are operated in timed relation by a suitable operating mechanism, not shown in the drawings, and which has been omitted for the purpose of simplification.

An important feature of the present invention resides in the means provided for laterally moving each chain thread 15 between adjacent bag tops out of its normal course of travel into the thread clipper, generally designated by the numeral 10, and best illustrated in FIGURE 4.

The thread clipper 10 comprises a fixed cutter blade 16 and a movable cutter blade 17. Blade 17 is actuated by an arm 18, which in turn is actuated by the usual operating mechanism of the sewing head, as is well known in the art. The fixed cutter blade is adjustably secured in position to a stationary part of the sewing head 2 by a lock screw 19. The two cutter blades, it will be noted, are positioned adjacent to the travel path of the bag tops, whereby means must be provided for laterally moving each connecting chain thread 15 out of its normal path of travel into position between the two knife blades of the thread clipper 10, as clearly indicated in FIGURE 4. To obviate any possibility of the chain thread becoming entangled with the leading end of the stationary cutter blade 16, the adjacent end of said cutting blade is made very blunt and slightly rounded thus to permit the chain thread to readily enter between the two knife blades during actuation of the movable cutter blade 17.

To thus guide each chain thread 15 into cutting engagement with the thread clipper 10, a thread guide element, generally designated by the numeral 21, is pivoted to the presser foot 5, by a pivot pin 22, best illustrated in FIGURE 4. The guide element 21 is provided with an enlarged bore for receiving a flanged bushing 23 the flanged end of which is engaged by the head 24 of pivot pin 22, and whereby the pivot pin may be firmly secured to an overhanging portion 25, provided on the presser foot 5, as clearly illustrated in FIGURES 1, 2 and 4. By thus mounting the guide element 21 it is always freely rotatable upon the bushing 23.

A spring 26 is coiled about the flanged end of the bushing 23, and has one end anchored in an aperture 27 provided in the guide element 21. The opposite end of the spring 26 is engaged with one end of a stud 28 adjustably mounted in the overhanging portion 25 of the presser foot, as shown in FIGURES 1, 2 and 4.

A stud 28 is shown provided with an annular shoulder 20, and has a reduced threaded terminal received in an elongated opening or slot 29 provided in the part 25 of the presser foot 5, whereby the stud may readily be adjusted in slot 29 by manipulation of the nut 31, thereby to vary the tension in spring 26.

Another important feature of the invention resides in the specific construction of the pivoted guide element 21. As best shown in FIGURE 4, it comprises a bifurcated terminal 32 which has a V-shaped notch 33 therein for receiving each chain thread 15, when said element is actuated to intermittently guide said chain threads into cutting engagement with the thread clipper 10, as the bag tops pass uninterruptedly through the cutter head.

A stop screw 34 is adjustably mounted in an arm 35 provided on the guide element 21, and is adapted to engage a portion 36 of the presser foot 5, as best illustrated in FIGURE 2. Stop screw 34 thus limits swinging move-

ment of guide element 21 when released between bag tops to move each chain thread 15 into cutting engagement with the thread clipper 10, as clearly illustrated in FIGURE 2.

Another important feature of the invention resides in the means provided for positively feeding the trailing end of bag top A to a point beyond the thread clipper, whereby the spring-biased pivoted thread guide 21 will have ample time to move the chain thread into the thread clipper without interference from the following bag top.

To thus assure positive movement of the leading bag A to a point beyond the thread clipper, the feed dog 4 is shown provided with an elongated extension 37 which co-acts with an elongated extension 38 on the presser foot 5. The elongated extension 38 of the presser foot engages the side of the bag top opposite from the extension 37 of the feed dog and provides a support therefor, whereby a positive feeding action is imparted to bag top A by the feed dog until the extensions 37 and 38 become disengaged from the bag top.

It is to be understood that in a bag top sewing machine such as herein disclosed, the weight of the filled bags is usually carried on a continuously traveling conveyor, not shown in the drawings. In some instances the conveyor may travel at the same speed as that of the bag tops as they are fed through the sewing head by the feed dog 4 and presser foot 5. However, to facilitate the operation of severing each chain thread between adjacent bag tops, the sewing head may be operated at a slightly higher traveling speed than the conveyor, whereby when the trailing end of each bag top moves out of engagement with the extensions 37 and 38, respectively, of the feed dog 4 and presser foot 5, the top of bag A will hesitate slightly in its forward movement with reference to the following bag top B, whereby the connecting chain thread 15 between bag tops A and B will develop a slight slackness which facilitates moving said chain thread into cutting engagement with the thread clipper to assure positive severing of each chain thread, as the bag tops are fed progressively through the sewing head.

The forward end of the feed dog 4 is preferably cut away or grooved, as indicated at 41 in FIGURES 1, 2, 6 and 7, thereby to permit each chain thread 15 to be more readily fed into the thread clipper 10 by the pivoted guide element 21, as shown more particularly in FIGURE 2.

In FIGURE 9 there is shown a feed dog 4a of slightly modified construction designed more particularly for use with a throat plate 3a, such as illustrated in FIGURE 10. The feed dog 4a, it will be noted, comprises two vertically spaced extensions 37a and 37b adapted to cooperate with extensions provided on the presser foot above and below the row of stitching, thereby to assure a positive feeding movement of the trailing end of each bag top to a point beyond the thread clipper 10.

Throat plate 3a differs from the one shown in FIGURE 6 in that the elongated openings or slots provided therein for receiving the feed dog are of uniform length, as shown in FIGURE 10, to accommodate the two forward extensions 37a and 37b on the feed dog. The presser foot used in conjunction with the feed dog and throat plate shown in FIGURES 9 and 10 is also provided with vertically spaced elongated extensions, partially shown in the drawings, adapted to cooperate with the extensions 37a and 37b of feed dog 4a to engage and positively feed the trailing end of each textile bag top through the sewing head.

In the operation of the apparatus, the flattened bag tops are progressively fed through the sewing head in closely spaced relation. The pivoted guide element 21 is normally positioned as shown in FIGURE 2, when the sewing head is empty of bag tops because of the action of spring 26. As bag A proceeds through the sewing head it engages the rounded surface 39 of guide element 21, whereby the guide element is moved out of the travel path of the bag tops against the tension of spring 25 by each

bag top. The bifurcated terminal 32 of the pivoted element 21 then rides over the adjacent wall of bag top A, with its bifurcated terminal straddling the row of chain stitching in said bag top.

The bifurcated terminal 32 of the pivoted guide element 21 assures that each chain thread 15 is accurately and positively guided into the thread clipper without failure. The groove 41 in the forward end portion of the feed dog for receiving each chain thread, when engaged by the bifurcated or forked terminal of the guide element 21, permits each chain thread 15 to enter the thread clipper 10 at a more desirable angle, whereby the chain thread cannot be forced out of the clipper when the clipper blades 16 and 17 engage the thread, even if such blades have been partially dulled from use.

The positive feeding of each bag top to a point beyond the thread clipper, and the relatively closer spacing of the bag tops, as they are progressively fed through the sewing head, results in increased production in that a relatively greater number of bag tops may be sewn in a given length of time, than is possible with bag top sewing machines as now commonly constructed.

The improved sewing head herein disclosed has proven extremely practical and efficient in actual use, as it may be operated at high speed without failure with a resultant reduction in operating and maintenance costs.

It is apparent that many modifications and variations of this invention as hereinbefore set forth may be made without departing from the spirit and scope thereof. The specific embodiments described are given by way of example only and the invention is limited only by the terms of the appended claims.

I claim as my invention:

1. In a machine for sewing the open tops of filled bags, a sewing head including a stitch-forming mechanism for continuously forming a chain stitch on said bag tops and a chain thread connecting adjacent bag tops, a presser foot, and a feed dog cooperable with said presser foot to progressively advance the bag tops along a predetermined travel path in closely spaced relation, a thread clipper spaced laterally from one side of said travel path comprising coacting cutting blades disposed at right angles to said path, means for positively advancing the trailing end of each bag top to a point beyond the thread clipper, said means comprising elongated coacting bag top engaging extensions provided respectively on the presser foot and said feed dog, a pivoted guide element located at the opposite side of said travel path being provided with spring means to constantly urge said pivoted guide element in a direction to traverse said travel path, said guide element having a notch therein which normally rides said chain stitch being formed on said bag tops and which is adapted to guide each chain thread between adjacent bag tops into immediate cutting engagement with said blades when said pivoted guide element momentarily traverses said travel path to free the bag tops from one another, actuation of said pivoted element being controlled by movement of the bag tops through said sewing mechanism.

2. The combination with a machine for sewing the open tops of filled bags, including a sewing head having a stitch-forming mechanism for continuously forming a chain stitch on said bag tops and a chain thread connecting adjacent bag tops, a presser foot, and a feed dog cooperable with said presser foot to progressively advance the bag tops along a predetermined travel path in closely spaced relation, of a clipper spaced laterally from one side of the travel path of the bag top comprising coacting cutting blades disposed at right angles to said travel path, means for positively advancing the trailing end of each bag top to a point beyond the thread clipper, said means

comprising elongated coacting bag top engaging extensions provided respectively on the presser foot and feed dog, a spring-biased guide element having a notch therein which normally rides said chain stitch being formed on said bag tops, said guide element being pivotally mounted to momentarily traverse said travel path between adjacent bag tops to engage and guide each connecting chain thread into cutting engagement with the thread clipper to free the bag tops from one another, actuation of said guide element being controlled by movement of the bag top through said sewing mechanism.

3. In a machine of the class described, a sewing head including a throat plate, a stitch-forming mechanism for continuously forming a chain stitch on said bag tops and a chain thread connecting adjacent bag tops, a presser foot, and a feed dog cooperable with said presser foot to progressively advance the bag tops along a predetermined travel path in closely spaced relation, a thread clipper spaced laterally from one side of said travel path and comprising coacting cutting blades disposed at right angles to said travel path, one of said knife blades being fixed and the other being movable relative thereto, said fixed blade having an elongated blunt end portion disposed adjacent to said travel path and so positioned with respect to said movable knife blade that the connecting chain threads between adjacent bag tops may readily be guided into cutting engagement with said knife blades, means for positively advancing the trailing end of each bag top to a point beyond the thread clipper, said means comprising elongated coacting bag top engaging extensions provided respectively on the presser foot and said feed dog, and means actuated by movement of the bag tops to the sewing head including a pivoted guide element having a notch therein which normally rides said chain stitch being formed on said bag tops and which is adapted to guide each chain thread between bag tops into immediate cutting engagement with the blades of the thread cutter.

4. In a machine for sewing the open tops of filled bags, a sewing head including a throat plate, a stitch-forming mechanism, a presser foot, and a feed dog cooperable with said presser foot to progressively advance the bag tops along a predetermined travel path in closely spaced relation and whereby a chain thread connects adjacent bag tops, a composite thread clipper spaced laterally from one side of said travel path, a pivoted guide element located at the opposite side of said travel path, said pivoted element being operable by movement of the bag tops through the sewing head to momentarily traverse said travel path between bag tops and engage and guide each chain thread into immediate cutting engagement with said thread clipper, means for positively advancing the trailing end of each bag top to a point beyond the thread clipper, said means comprising elongated coacting bag top engaging extensions provided respectively on the presser foot and said feed dog, means causing each bag top to momentarily hesitate in its traveling movement as the feed dog and presser foot disengage the trailing end thereof, such momentary hesitation of each bag top causing a slack to develop in each chain thread whereby said guide elements may readily move each chain thread into immediate cutting engagement with the thread clipper.

References Cited in the file of this patent

UNITED STATES PATENTS

2,376,417	Chudner	May 22, 1945
2,569,396	Bates	Sept. 25, 1951
2,630,086	Kindseth et al.	Mar. 3, 1953
2,670,700	Kindseth	Mar. 2, 1954