March 21, 1967 A. E. CARLILE 3,309,746

END STOPS

Filed May 26, 1964 3 Sheets-Sheet 1

Fig. 1.

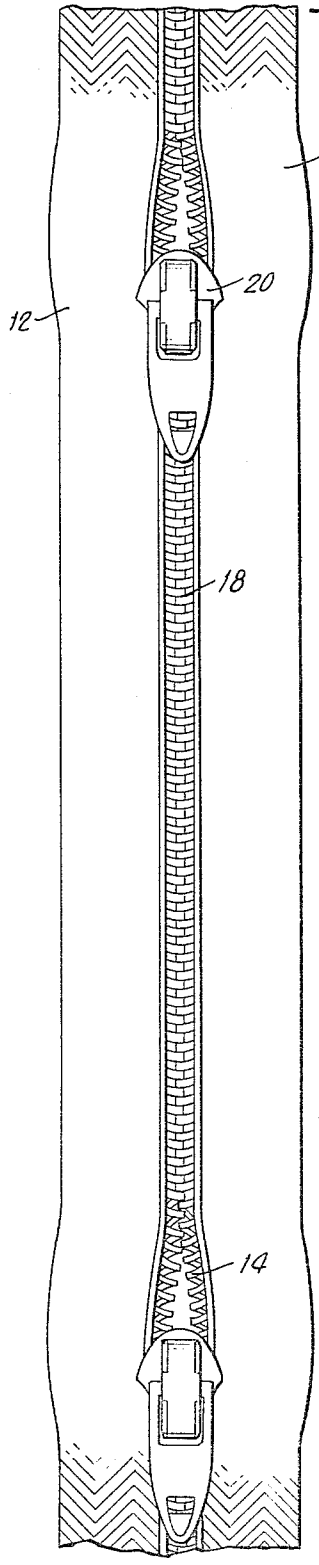


Fig. 2.

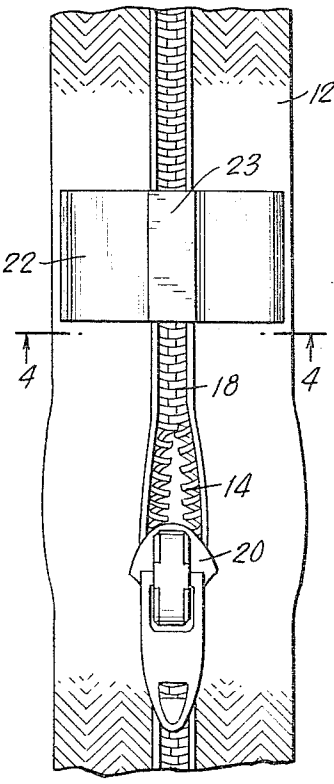
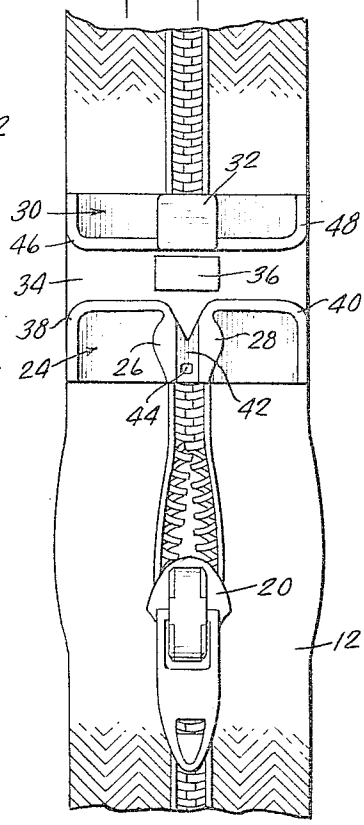


Fig. 3.



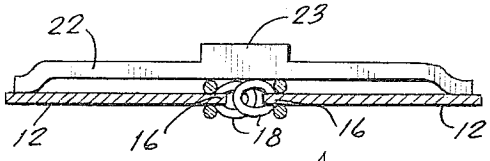


Fig. 4.

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March 21, 1967 A. E. CARLILE 3,309,746

END STOPS

Filed May 26, 1964 3 Sheets-Sheet 2

Fig. 5.

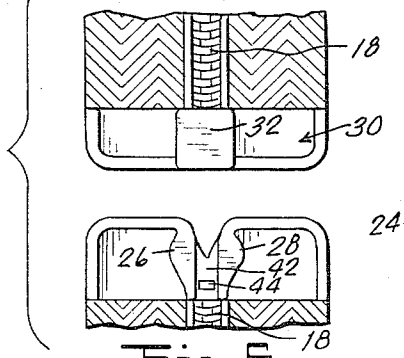


Fig. 8.

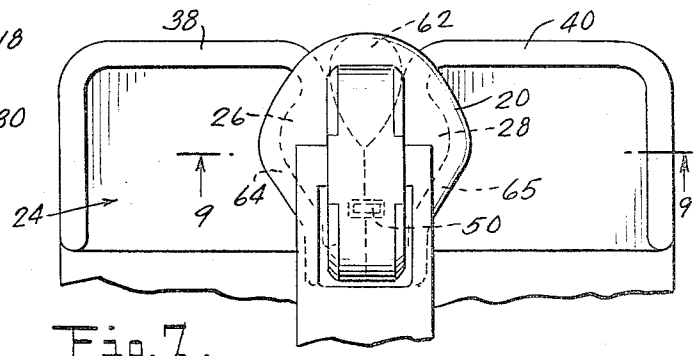


Fig. 6.

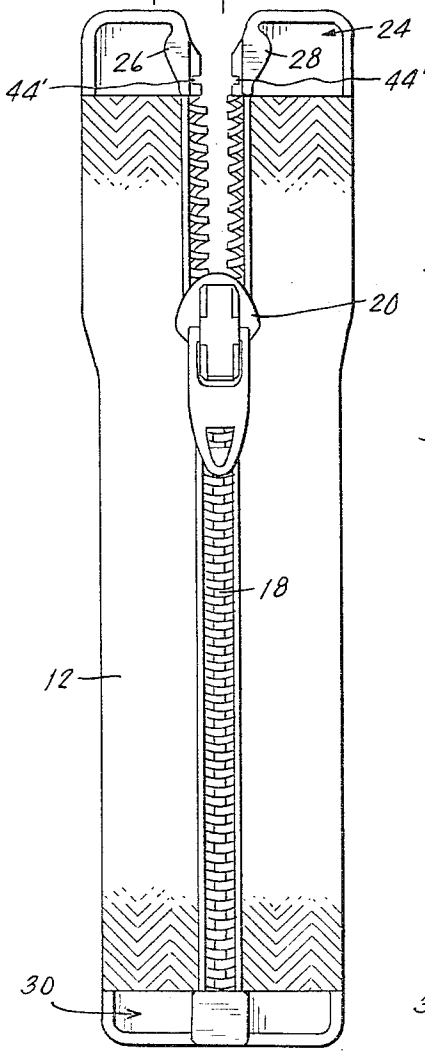


Fig. 7.

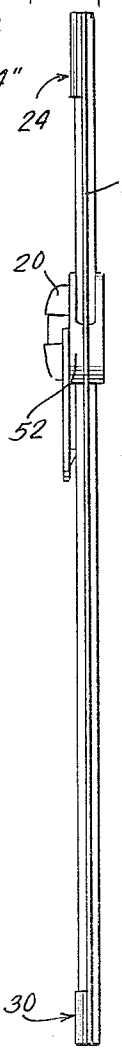


Fig. 9.

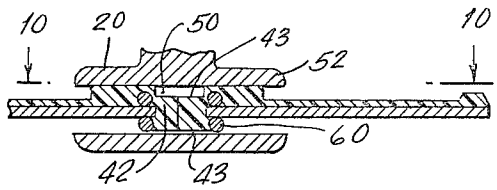
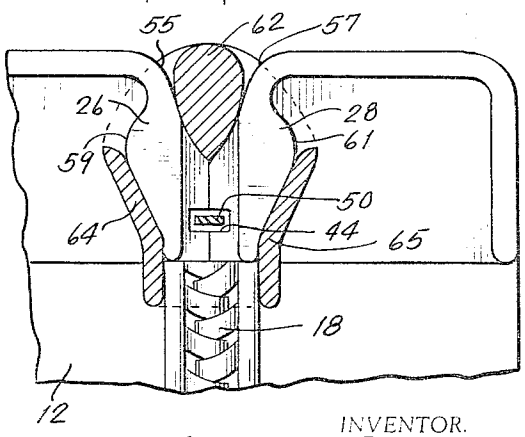


Fig. 10.



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Filed May 26, 1964 3 Sheets-Sheet 3

Fig. 11

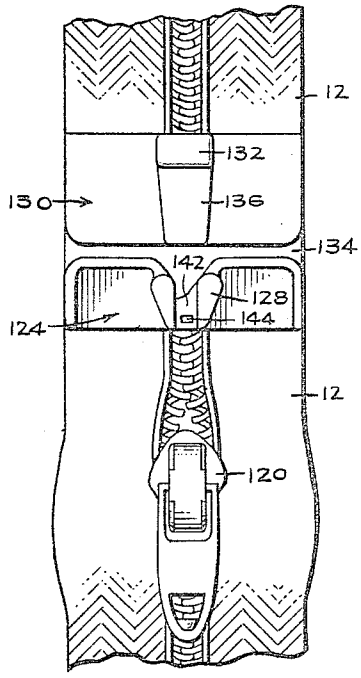


Fig. 13

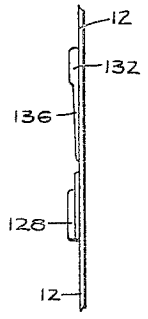
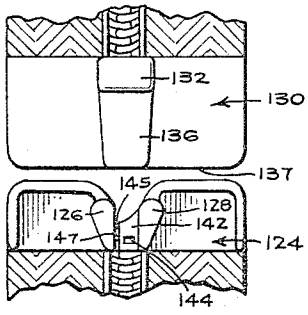


Fig. 12



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United States Patent Office 3,309,746 Patented Mar. 21, 1967

3,309,746

END STOPS

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Filed May 25, 1964, Ser. No. 370,172
7 Claims. (Cl. 24—205.11)

This invention relates to slide fasteners and, more particularly to improved end stops and method of making the same for an open end type of filament slide fastener.

In the manufacture of open end type slide fasteners, it is the conventional practice to provide extended lengths of slide fastener chain which consists of a pair of stringer tapes disposed adjacent each other with each of the stringers having a series of equally spaced interlocking fastener elements attached to its beaded edge such that the opposed elements of the respective stringers are interengaged to provide what is termed "continuous chain." At regular intervals, the interlocking fastener elements of the continuous chain are separated and a slider is attached for engaging and disengaging the fastener elements in a well known manner.

Once the slider is attached, it is the usual practice to remove at regular intervals, a group of interengaged fastener elements from the stringers so as to provide a gap space therein for the purpose of providing a length of chain which is free of fastener elements. A strip of reenforcing tape is sometimes secured transversely to the longitudinal length of the tape stringers intermediate the length of the gap space for the purpose of joining the tape stringers together. Suitable end stops are then secured to the beaded edge of the gap space of each of the stringer tapes adjacent the respective end fastener elements. The end stops prevent the slider from moving off the elements and into the gap space. The chain can then be severed into individual lengths by cutting the reenforcing tapes substantially at their midpoint. Open end type of slide fasteners in which the slider is normally locked in position at the open end require a slider having a locking detent adapted to engage one of the fastener elements to prevent the slider from moving in an opening direction. This type of locking slider is undesirable when used with a filament type fastener, because the locking detent tends to tear the filament elements from the bead of the stringer tape when lateral stresses are applied thus causing the slide fastener to become inoperative.

Filament type slide fasteners produced by this method, thus do not have a suitable locking device for retaining the slider in a given position; and, necessarily require the separate steps of attaching the reenforcing tape and the end stops. It is to an improved slide fastener construction and to a method of manufacturing the same that the present invention relates.

It is the general object of this invention to provide a reenforcing tape end with integral end stops for a slide fastener which can be applied to the stringer tapes while in continuous chain form.

Another object of this invention is to provide means formed integrally with the combined reenforced tape end and top stop of a slide fastener for preventing the slider from moving in the opening direction.

Still another object of this invention is to provide an improved method of making combined reenforced tape ends and end stops which can be applied to both stringer tapes simultaneously and which are positioned accurately along the beaded edges of the stringer tapes.

A further object of this invention is to provide an improved locking top stop for an open end slide fastener which is formed simultaneously with the adjacent reenforced tape end.

Still another object of this invention is to provide slide

fastener tape ends impregnated with a thermoform plastic for reenforcement which can be easily pierced for sewing the individual slide fastener to a garment or the like.

Another object of this invention is to provide improved reenforcing tape ends and end stops made of thermoform plastic which can be conveniently and inexpensively fabricated and applied to the stringer tapes while in chain form and before the stringers are cut apart from one another.

Various other objects and advantages of this invention will be more apparent in the course of the following specification, and will be particularly pointed out in the appended claims.

In the accompanying drawings, there is shown for the purpose of illustration, an embodiment which the invention may assume in practice.

In these drawings:

FIG. 1 is a plan view of a fragment of a length of slide fastener chain showing sliders assembled thereon;

FIG. 2 is a plan view of a fragment of slide fastener chain showing the first step in accordance with the present invention of attaching the reenforcing end members to the stringer tape;

FIG. 3 is a view similar to FIG. 2 showing the step of forming the reenforcing end members of the stringer tape;

FIG. 4 is a sectional view taken along the lines 4—4 of FIG. 2;

FIG. 5 is a partial plan view similar to FIG. 3, showing the stringer tapes severed across the reenforcing end members;

FIG. 6 is a plan view of a finished open end type of slide fastener showing the reenforcing ends and end stops assembled thereon;

FIG. 7 is a side view of the finished fastener as shown in FIG. 6;

FIG. 8 is an enlarged plan view of the finished fastener shown in FIGS. 6 and 7 with the slider in the upper locked position;

FIG. 9 is a sectional view taken along the lines 9—9 of FIG. 8;

FIG. 10 is a sectional view, taken along the lines 10—10 of FIG. 9;

FIG. 11 is a plan view of another embodiment of this invention;

FIG. 12 is a partial plan view similar to FIG. 11, showing the stringer tapes severed across the reenforcing end members; and,

FIG. 13 is a side view of the embodiment shown in FIGS. 11 and 12.

Referring more particularly to FIGS. 1 to 4 of the drawings, there is shown a length of slide fastener chain of the continuous filament type which is generally supplied in rolls to the operator for attaching top and bottom stops. Each length of slide fastener chain consists of a pair of continuous length stringer tapes **12** with each having a coiled filament **14** secured to the beaded edge **16** thereof. The convolutions of coiled filament **14** provide a continuous series of spaced apart interlocking fastener elements **18** attached to the opposed beaded edges **16** of tapes **12**. At predetermined intervals, the completed continuous filament slide fastener chain is separated to space apart a group of fastener elements **18**, after which a slider **20**, having divergent wing members, is fitted to the stringer tapes and then crimped into operable relation with the fastener elements for the purpose of engaging and disengaging the fastener elements in a well known manner.

To make individual slide fasteners of the desired length incorporating the combined reenforcing tape ends and end stops of the present invention, a strip of thermoplastic

material 22 is placed on one side of the tape, at points spaced according to the fastener length desired. Strip 22 includes a thickened central portion 23 which overlies a group of fastener elements 18 of the continuous slide fastener chain. Fastener elements 18 of the continuous filament type of chain are thermally compatible with the thermoplastic material of strip 22 so as to accept the thermoplastic material of strip 22 which will form the reenforced tape ends and end stops of the present invention. Thus, the group of elements that strip 22 overlies do not necessarily have to be cut out or "gap spaced."

As best shown in FIG. 3, heat and pressure is applied to strip 22 by a pair of suitable dies (not shown), the facing surfaces of which are suitably contoured, for simultaneously impregnating stringer tapes 12 with plastic from strip 22, and forming the upper reenforced tape end 24 and the lower reenforced tape end 30 of the next individual fastener. A scrap portion 34 of plastic impregnated stringer tape separates the upper reenforced tape end 24 from the lower reenforced tape end 30, and can be formed, if desired, to include a land member 36. Central portion 23 provides the necessary quantity of material to form the end stops and to fill in the space between adjoining fastener elements 18. Advancement of the continuous chain a distance corresponding approximately to one fastener length then places the continuous chain in position for the application of a second set of reenforced tape ends in a manner substantially as described hereinabove.

In the formation of the upper reenforced tape end 24, there is included a pair of lobe-shaped stops 26 and 28 each having a raised shoulder 38 and 40, respectively, which extend outwardly therefrom to the edge of their respective stringer tapes 12. Shoulders 38 and 40, respectively, are then curved to extend along the outer longitudinal edges of each of their stringer tapes 12 for a short distance. A channeled portion 42, as is more clearly shown in FIG. 9, is formed integrally with and located intermediate end stops 26 and 28. The lower surface 45 of channel portion 42 is located below the bottom surface of stringer tapes 12. Upper surface 43 of channel portion 42 is formed to include a substantially rectangular well 44.

In a similar manner lower reenforced tape end 30 is formed to include a bridged end stop 32. Shoulders 46 and 48, respectively, extend outwardly from opposite sides of end stop 32 to their respective edges of stringer tape 12 at which point shoulders 46 and 48 are each then curved to extend for a short distance along the edge of the stringer tape.

After the reinforcing tape ends 24 and 30 have been secured to the tape stringers in a manner as above described, the chain is moved to the next station and positioned therein by land 36 such that the scrap portion 34 which includes a portion of the stringer tapes 12 and fastener elements 18 under the thermoplastic coating are cut away and removed, as is shown in FIG. 5, so as to provide an individual fastener. It should be noted that land member 36 can be eliminated and bridged end stop 32 can be used for locating the chain in the cutting station. The reenforced tape end 30, which is of a thin plastic coating, can be used as a flange for securing the finished slide fastener to a garment or the like.

The stringer tapes 12, which are joined together at the upper end of the fastener are then separated by cutting longitudinally through channel portion 42. This cutting operation can be accomplished simultaneously with the cutting away of scrap portion 34, or by a separate cutting operation to provide an individual open end slide fastener, as is best shown in FIG. 6. In cutting central channel portion 42, well 44 is separated into two recesses 44' and 44'' for a purpose hereinafter disclosed.

The function of my improved slide fastener construction of the present invention will now be described with particular reference to FIGS. 7 to 10. Slider 20 includes a detent 50 projecting downwardly from the inner surface of the upper wing 52. When the slider 20 is moved upwardly to fully close the open end slide fastener, the endmost fastener elements 18 as well as the lobe-shaped end stops 26 and 28 on their respective stringer tapes 12 enter and are positioned within the Y-shaped slider channel 60, as shown in FIGS. 8 to 10 of the drawings. Because the end stops 26 and 28 and channel portion 42 are formed from a thermoplastic material, they can be compressed slightly such that slider 20 and detent 50 located thereon, can be moved into position without scoring or in any other way damaging their surfaces.

In this closed position, the inner side walls 55 and 57, respectively, of end stops 26 and 28 abut against the diamond 62 of slider 20. The outer side walls 59 and 61, respectively, of lobe-shaped end stops 26 and 28 engage the inner surfaces of channel members 64 and 65, respectively, of slider 20. In moving to this closed position, end stops 26 and 28 are brought into engagement such that individual recesses 44' and 44'' are moved into alignment with each other to re-form well 44. Detent 50 on the upper wing 52 of slider 20 rides on the upper surface 43 of channel portion 42 to frictionally engage the surface and to prevent slider 20 from returning to the open position. To insure locking of slider 20 in the fully closed position, detent 50 is further moved such that it is seated in well 44. Diamond 62 engaging inner side walls 55 and 57 tends to open the fastener chain and displace slider 20 downwardly. However, detent 50 will bear against the lower walls of recesses 44' and 44'', forming well 44, to prevent the opening movement.

In opening the slide fastener, a slightly greater force than normal is initially required to move slider 20 downwardly so that detent 50 can be moved out of well 44 and ride over the upper surface 43 of channel portion 42 to open the fastener chain. It will thus be seen that in the closed position end stops 26 and 28, which are concealed within slider 20, prevent the slider from being removed from the open end slide fastener. While at the same time detent 50 on slider 20 will be seated in well 44 to act as a locking device for preventing slider 20 from moving downwardly.

In the embodiment shown in FIGS. 11 to 13, the tape reenforcing ends 124 and 130 are secured to tape stringers 12 in a manner and method similar to that described hereinabove. In this embodiment the channel portion 142, which includes well 144, is integrally formed with top stop 128 such that the edge 145 of channel portion 142 abuts against the flat side surface 147 of top stop 126. The construction and operation of slider member 120 is substantially the same as that previously described with reference to FIGS. 1–10. In addition, as shown in FIGS. 11 to 13, the area of tape reenforcing end 130 has been enlarged and the area of scrap portion 134 reduced. The thermoform plastic tape end 130 is of substantially uniform thickness except for the tapered wedge shaped portion 136 overlying the fastener elements 18. Wedge shaped portion 136 extends from bridged end stop 132 to the bottom edge 137 of tape end 130 to provide rigidity for tape end 130. In this embodiment, the area of the scrap portion 134 has been reduced and the area of tape end 130 has been increased for the purpose of providing a single relatively large reenforced flange of substantially uniform thickness which can easily be manipulated by an assembler and pierced by a sewing needle for attaching the finished slide fastener to a garment or the like. It should be noted that wedge shaped portion 136 provides greater longitudinal reenforcement in the area of the continuous chain, with a decreasing lateral reenforcement to permit the fastener to be more easily handled.

As a result of my invention, it will be seen that there is provided an improved reenforced tape end and end stops and method of making the same which can be inexpensively and easily fabricated without the necessity of

expensive tools or other equipment. In addition, the improved tape ends are formed of a material which can be easily pierced to sew the individual slide fastener to a garment or the like. It will also be seen that there is provided an end stop and lock for an open end type of slide fastener which is constructed and arranged so as to provide a maximum closing movement of the slider.

While there is shown and described an embodiment which the invention may assume in practice, it will be understood that this embodiment is merely for the purpose of illustration and description, and that other forms can be devised within the scope of the invention as defined in the appended claims.

I claim:

1. In an open end slide fastener which includes:
(a) a slider member,
(b) a pair of slide fastener tape stringers joined at one end thereof and each carrying a plurality of interlocking fastener elements adapted to be engaged and disengaged in response to the movement of said slider member towards the closed and open position, respectively,
(c) top stops secured to each of said stringers adjacent its endmost fastener element and at their respective open ends for preventing said slider member from being removed therefrom, said top stops adapted to be moved conjointly into substantially parallel relationship in response to the movement of said slider member to the fully closed position, the improvement comprising:
(d) detent means to project outwardly from the inner surface of one wing of said slider member and adapted for movement therewith;
(e) there being a longitudinally elongated channel portion carried by at least one of said top stops and containing a well therein such that when said slider member is moved to its fully closed position said channel portion will be moved intermediate said fastener elements with its upper surface lying in a plane to interfere with the passage of said detent means, movement of said slider member to said fully closed position enabling said detent means to move into position relative to said channel portion whereby said detent means is received within said well to impede the movement of said slider member from said fully closed position to said open position.

2. An open end slide fastener according to claim 1, wherein said channel portion is separated into a pair of channel members, each of said channel members being carried by one of said top stops and containing a recess therein, whereby when said slider member is moved to its fully closed position, said channel members are moved into engagement and said well is formed.

3. An open end slide fastener according to claim 2, wherein each of said recesses carried by their respective channel members are substantially rectangular in shape, whereby when said recesses are joined a substantially square shaped well is formed.

4. An open end slide fastener according to claim 3, wherein said channel members are of a thickness which can be readily accommodated within said slider member and of a width such that when said slider member is moved to the fully closed position their edges abut against each other to form said well.

5. An open end slide fastener according to claim 1, wherein said longitudinally elongated channel portion is formed from a yieldable material which is depressed by said detent means when said slider member is moved to its fully closed position.

6. An open end slide fastener according to claim 2 wherein said top stops are moved together and nested within said slider member when it is in the fully closed position and said detent means carried by one of the wings of said slider is seated in said well formed thereby.

7. An open end slide fastener according to claim 2 wherein said detent means protrudes downwardly from the surface of the upper wing of said slider member.

References Cited by the Examiner

UNITED STATES PATENTS

2,076,501	4/1937	Larroque	24—205.11
2,220,136	11/1940	Marinsky	24—205.11
2,267,384	12/1941	Waldes	24—205.11
2,674,559	4/1954	Zobel	156—66
2,832,119	4/1958	Neitlich	24—205.11
2,928,156	3/1960	Doelter	24—205.11
3,001,904	9/1961	Porepp	156—66

FOREIGN PATENTS

56,693	12/1912	Austria.
59,141	10/1941	Denmark.
2,167,577	4/1964	Germany.
706,794	4/1954	Great Britain.
943,976	12/1963	Great Britain.

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