May 13, 1952 R. P. SCHERER 2,596,176

METHOD OF FORMING STRIPES ON CAPSULES AND THE LIKE

Filed May 18, 1948

2 SHEETS—SHEET 1

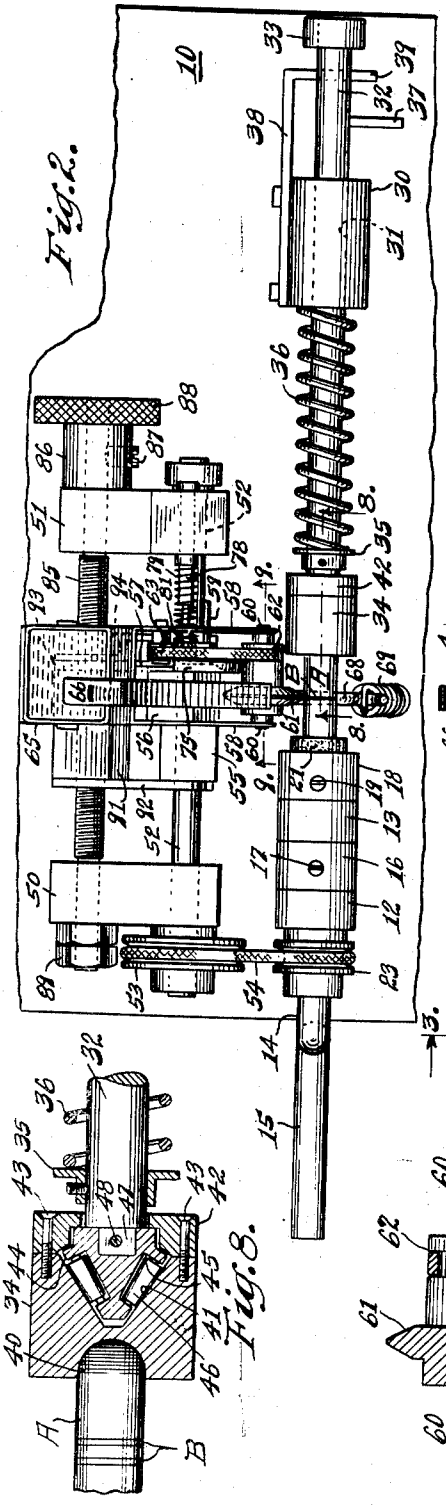


Fig. 2.

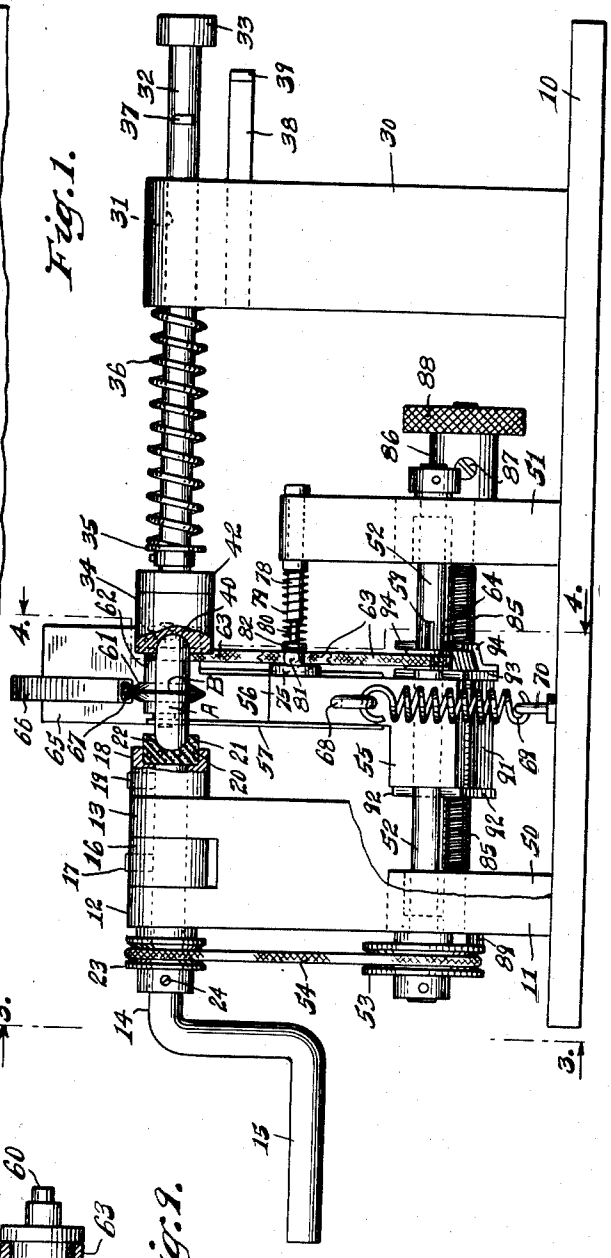


Fig. 1.

Fig. 8.

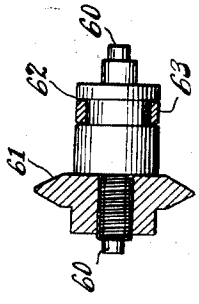


Fig. 9.

INVENTOR.
Robert P. Scherer.
BY Bair & Freeman
Att'ys.

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2 SHEETS—SHEET 2

Fig. 3.

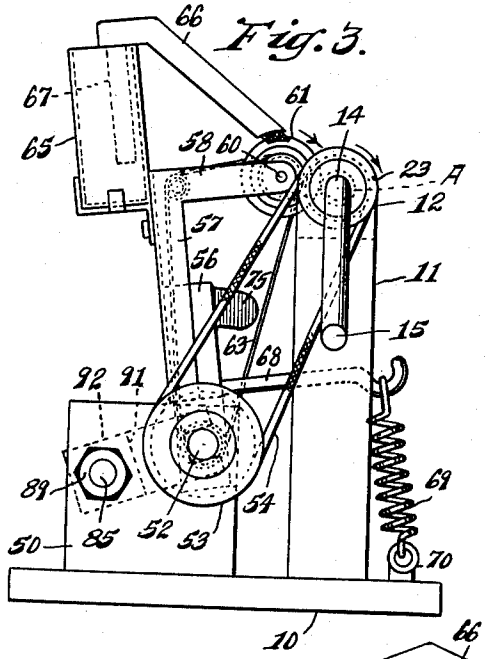


Fig. 4.

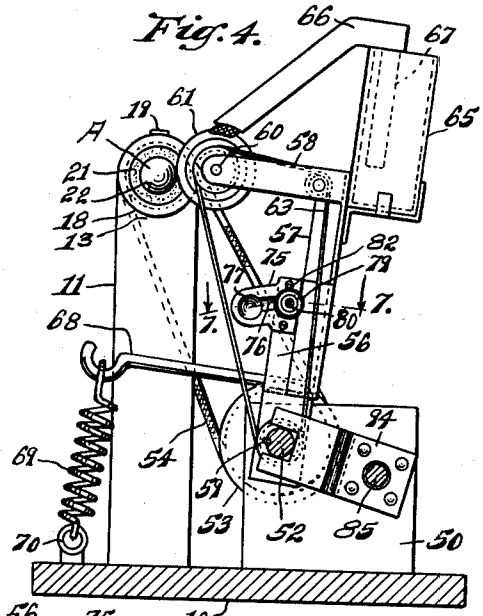


Fig. 5.

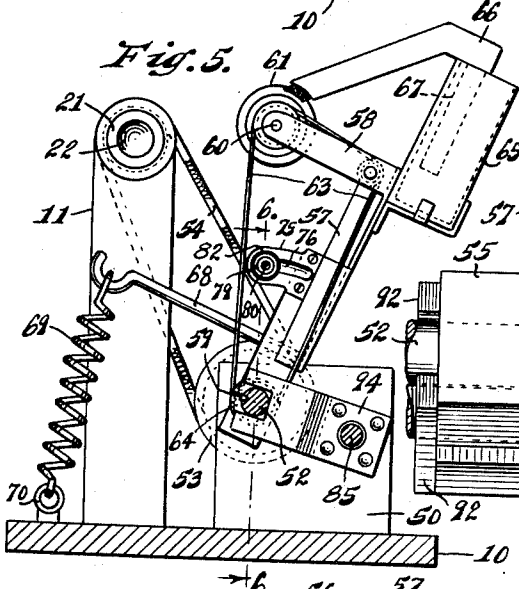


Fig. 6.

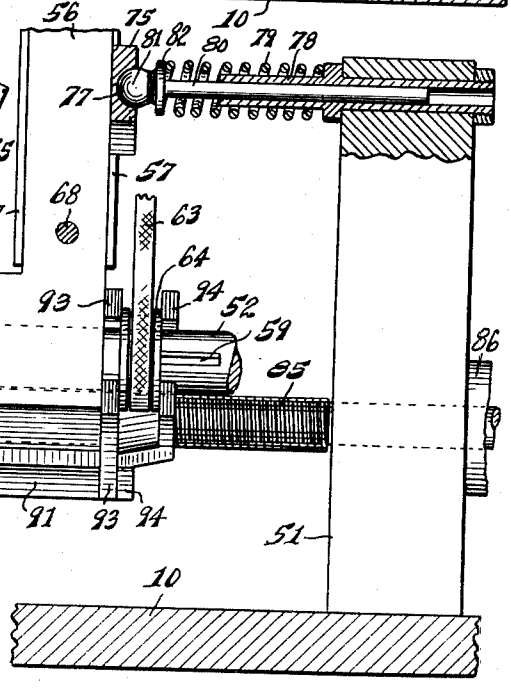
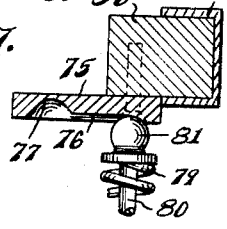


Fig. 7.



INVENTOR.
Robert P. Scherer.
BY
Bair & Freeman
Att'ys.

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UNITED STATES PATENT OFFICE

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METHOD OF FORMING STRIPES ON CAPSULES AND THE LIKE

Robert Pauli Scherer, Detroit, Mich., assignor to R. P. Scherer Corporation, Detroit, Mich., a corporation of Michigan

Application May 18, 1948, Serial No. 27,779

1 Claim. (Cl. 117—43)

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This invention relates to method and apparatus for striping rounded objects.

The invention pertains specifically to the application of aqueous coloring media to gelatin capsules in the form of narrow bands or areas that, on drying, form colored stripes sharply contrasting with the remainder of the capsules. In this manner a distinctive appearance is conferred on the capsules. The location, width, number and color of the stripes can be varied as desired, so that any one type of capsule can be rendered readily distinguishable from other types, as according to amount or nature of the capsule contents. Further, the distinctive bands or stripes can be used to characterize the capsules as the product of a certain manufacturer, in other words, as a mark of origin.

I have found that for successful application of an aqueous coloring medium to a gelatin capsule, the surface area on the capsule to be colored should be slightly rubbed or scuffed or worn down. Then, the color will adhere to the surface of the capsule when the aqueous coloring medium has been dried, to form a sharply defined adherent stripe or band. Therefore, one feature of this invention comprises the step of subjecting the capsule area to be colored to attrition before or while the aqueous coloring medium is applied to the capsule.

I have also provided an apparatus by which the method of this invention may be practiced. This apparatus includes chucks or concave blocks or other means adapted to receive opposed portions of a capsule or other rounded object to be striped. Preferably, the apparatus includes a spring or other means for resiliently biasing one chuck or block toward the other for holding the capsule or other rounded object therebetween. Provision can be made for rotating the chucks or blocks so that the capsule or other rounded object can be made to spin.

The aqueous coloring medium is suitably applied to the capsule or other rounded object when held as described by means of a rotatable disc having a narrow edge adapted to contact the capsule or other rounded object. Provision is made for a differential in peripheral speed as between the capsule or other rounded object and the edge of the disc whereby the capsule is subjected to attrition while the disc applies the coloring medium by any suitable means, for instance, a wick having one end dipping into a color container and the other end contacting the edge of the disc ahead of the capsule.

For applying colored bands or stripes to the capsule or other rounded object at various localities, provision is made for relative displacement as between the coloring disc and the capsule holding means. Further, the disc as well as the means for rotatably supporting the same can be swung or otherwise moved toward and away from the capsule or the like, for initiating and terminating the color applying step.

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It is therefore an important object of the present invention to provide apparatus and methods for striping gelatin capsules or other rounded objects by which a capsule or the like may be subjected to attrition before or while the color is applied thereto.

Other and further objects and features of this invention will become apparent from the following description and appended claim taken in conjunction with the accompanying drawings which show, by way of an illustrative example, a device according to the present invention. More particularly:

Figure 1 is a side elevation, with parts broken away and other parts shown in section, of a device according to the present invention;

Figure 2 is a plan view of the device of Figure 1;

Figure 3 is an end elevation, with parts shown in section, taken on the line 3—3 of Figure 2;

Figure 4 is a vertical cross sectional view on the line 4—4 of Figure 2 showing the coloring disc as contacting a capsule being striped;

Figure 5 is a view similar to Figure 4, but showing the coloring disc retracted from the capsule holding means;

Figure 6 is an enlarged fragmentary vertical cross sectional view taken on the line 6—6 of Figure 5;

Figure 7 is an enlarged fragmentary cross sectional view taken on the line 7—7 of Figure 4;

Figure 8 is an enlarged fragmentary cross sectional view taken on the line 8—8 of Figure 2; and

Figure 9 is an enlarged fragmentary cross sectional view taken on the line 9—9 of Figure 2.

In the drawings a suitable base or other support for the device is indicated at 10. A block 11 rising from the support 10 has formed therein spaced aligned bearings 12 and 13 for a crank shaft 14 having a crank 15 (for manual rotation) and carrying a collar 16 affixed to the shaft by means of a set screw 17 between the bearings 12 and 13. The collar 16 fits exactly the interspace between the bearings 12 and 13 and thus prevents longitudinal displacement of the shaft 14. One end of the shaft projects beyond the bearing 13 and carries a block 18 held rigidly to the shaft by a set screw 19. The free face of the block 18

is formed with a recess 20 receiving and holding a rubber block 21 having its free end recessed, as at 22, to receive one portion or end of a capsule or other rounded object. The connections between the shaft 14 and the two blocks 18 and 21 are rigid, and the two recesses 20 and 22 face away from the end of the shaft 14.

Between the crank portion 15 of the shaft 14 and the bearing 12, a pulley 23 is affixed to the shaft 14 by means of a set screw 24.

Another block 30 rising from the support or base 10 has formed therein a bearing 31 aligned with and spaced from the bearing 13 and from the rubber block 21. The bearing 31 rotatably receives a rod 32 carrying at the end away from the rubber block 21 a hand knob 33 and at the other end a chuck or block 34 (described in greater detail hereinbelow). A collar 35 is affixed to a rod 32 adjacently the block 34, and a spring 36 disposed around the rod 32 between the support 30 and the collar 35 urges the block 34 toward the rubber block 21.

Between the support 30 and the hand knob 33, a pin or lug 37 projects from the rod 32 and is adapted on retraction of the rod 32 from the bearing 31 and rotation of the rod to engage the bent portion 39 of an arm 38 projecting from the support 30 and thus to hold the rod 32 in retracted position.

The block 34 is formed with a terminal recess 40 (see Figure 8) facing and spaced from the recess 22 and the rubber block 21 and, like the latter, is adapted to receive an end or portion of a capsule or other rounded object. Further, the block 34 is freely rotatable with respect to the rod 32. More particularly, the block 34 is formed with a frustoconical recess 41 facing the end of the rod 32 and this recess is partially closed by a ring 42 projecting inwardly over the edge of the recess 41, being attached to the block 34 by screws 43. A frustoconical head piece 44 for the rod 32 fits within the recess 41 and has its conical face formed with an annular recess 45 adapted to receive roller bearings 46. The head piece 44 is rigidly connected to the end of the rod 32, which is formed into square form as indicated at 47 to fit into a similarly shaped recess in the head piece 44, being attached to the latter by a set screw 48.

The parts of the apparatus so far described serve to hold and rotate a capsule or other rounded object to be striped. The remaining parts serve to apply the stripe. These other parts are supported by a block 50 and another block 51 rising from the support 10 and include a shaft 52 rotatably journalled in suitable aligned bearings in the blocks 50 and 51. A pulley 53 is affixed to the shaft 52 outside the block 50 and carries a belt 54 which also passes over the pulley 23 on the shaft 14. Further, a carriage 55 is rotatably disposed about the shaft 52 so as to be movable lengthwise thereover. This carriage is provided with an upstanding arm 56 about which the lower part of an erect member 57 of U-shaped cross section is affixed, with its open side facing the supports 11 and 30. Above the arm 56, one side of the U-shaped member 57 is offset from the other side. From the upper end of the member 57 arms 58 project toward the blocks 21 and 34. The ends of these arms are pierced by aligned apertures to form bearings for a shaft 60 having affixed thereto a pulley 62 and an inking disc 61 formed with a frustoconical edge.

Adjacent to but spaced from the carriage 55, a pulley 64 is disposed about the shaft 52 to slide

lengthwise over a key 59 longer than the width of the pulley, so that the pulley 64 will rotate with the shaft 62 even when displaced axially of the latter. A belt 63 passes over the two pulleys 62 and 64.

The upright member 57 carries, at its top and along the side away from the arms 58, an ink or color container 65 having a curved tube 66 extending from its interior and over the edge of the container to a place immediately above the top of the coloring disc 61. The tube contains a wick 67 having one end dipping into the liquid coloring medium or ink in the container 65 and having its other end brushing against the edge of the disc 61 to keep the latter supplied with ink or other liquid coloring medium.

An arm 68 projects from the carriage arm 56 between the supports 11 and 30 and has its free end hooked to receive and hold one end of a coil spring 69, the other end of which is engaged in the eye 70 of a lug or ear affixed to the face 10. Thus, the spring 69 urges the arm 68 and the disc 61 supported thereby toward the blocks 21 and 34 and toward any objects held therebetween to be striped.

Since the carriage 55 is freely swingable with respect to the shaft 52 and is urged by the spring 69 toward a position wherein the disc 61 contacts an object to be striped, it is convenient to include with the apparatus, means for releasably holding the carriage in an angular position wherein the disc 61 is so spaced from the blocks 21 and 34 that the latter are easily accessible, as for placing therebetween an object to be striped and for subsequently removing the same. For this purpose, an arcuate arm 75 may project from the top of the carriage arm 56 in the same direction as the arm 58. The arm 75 is formed with a groove 76 leading to a semi-spherical or rounded, relatively deeper recess 77 in that part of the arcuate arm overlying the carriage arm 56 (see Figure 7). For cooperation with the arm 75, I provide (see Figure 6), a hollow detent arm 78 extending from the support 30 toward the arcuate arm 75 and receiving therearound a coil spring 79 having one end abutting against the support 30 and the other end abutting against a collar 82 on a rod 80 slidable within the hollow arm 78. Past the collar 82 the rod 80 is formed with a semispherical or rounded head 81 adapted to slide in the groove 76 and to rest within the recess 77 in the arcuate arm 75. Thus, when the carriage arm 56 and parts supported therefrom are swung away from the capsule or object to be striped, the head 81 slides in the groove 76 and lodges in the recess 77 to hold the carriage arm in retracted position. When the carriage arm is again to be swung into striping position, then the head 81 is forced out of the cavity 77, against the force of the spring 79, and thereafter slides in the groove 76 until the carriage arm has reached the desired position for striping.

To displace the carriage 55 and pulley 64 lengthwise of the shaft 52 and thereby also with respect to the object to be striped, means are provided including a shaft 85 extending through and past aligned bearings in the blocks 50 and 51 outside and below the shaft 52. The portion of the shaft 85 between the blocks 50 and 51 is threaded, as is also the portion outside the block 50. Outside the block 51, the end of the shaft is provided with a knurled hand knob 88 and, between the block 51 and the knob 88, a collar 86 is affixed about the shaft by means of a set screw 87. A nut and locknut assembly 89 is provided

for the threaded end of the shaft 85 outside the block 50. Further, the carriage 91 is threaded onto the shaft 85 between the blocks 50 and 51 and this carriage has projecting therefrom three fixed spaced forked arms 92, 93 and 94. The forks 92 and 93 abut the outsides of the carriage 55 with the shaft 52 therebetween, while the fork 94 (which has its end offset away from the other two forks) abuts the free outside of the pulley 64, with the shaft 52 within the fork. Thus, the shaft 85 may be rotated by turning the hand knob 88, causing longitudinal displacement of the carriage 91 over the shaft 85 so that the three forks 92, 93 and 94 acting on the carriage 55 and pulley 64 displace the latter lengthwise of the shaft 52 to any desired extent. The locknut assembly 69 and the collar 86 hold the shaft 85 against longitudinal displacement when rotated manually.

For operation of the apparatus described, the knob 33 is pulled outwardly and rotated to retract the block 34 away from the block 21 and held in retracted position by engagement of the lug 37 behind the belt portion 39 of the arm 38. A capsule (indicated at A) is then inserted into the recess in rubber block 21 and the arm 33 is rotated so that the lug 37 is disengaged from the bent portion 39 of the arm 38. Then the spring 36 urges the block 34 towards the other end of the capsule so that this other capsule end is received into the recess 40 in the block 34 and the capsule is resiliently retained. The capsule may then be rotated or spun by manual cranking of the crank 15. Note that as mentioned hereinabove, the block 34, is so connected with the rod 32 as to be freely rotatable with respect to the latter.

Before the capsule A is inserted between the blocks 21 and 34, the carriage 55 and parts supported therefrom have been swung away from the blocks 21 and 34 into the position shown in Figure 5 wherein the head 81 of the detent arm is retained in the recess 77 to maintain the parts in this position. When the capsule A has been inserted within and between the blocks 21 and 34, the carriage 55 is swung into the position shown in Figures 3 and 4 wherein the edge of the disc 61 contacts the capsule under the urging of the spring 69. At this time or earlier, the knob 88 is turned to adjust the edge of a disc 61 to the exact area on the capsule where it is desired to apply the stripe.

For actual striping, the crank 15 is operated to rotate the shaft 14 and thereby also the capsule A. The belt 54 trained around the pulleys 23 and 53 causes rotation of the shaft 52 and of the pulley 64 keyed thereon but not the carriage 55 which is rotatable with respect to the shaft 52. The belt 63 trained over the pulleys 64 and 62 then causes the shaft 60 and the inking disc 61 to rotate. The ratios of the pulleys 23, 53, 62 and 64 are so adjusted that the peripheral speeds of the capsule A and of the disc 61 are different, to cause attrition of the area of the capsule traversed by the disc 61. Although the drawing shows the disc 61 and capsule A as rotating in the same direction, it is also possible to have the capsule and the disc rotating in opposite directions.

For removal of the capsule after striping has been completed, the carriage arm 56 is swung away from the capsule and the rod 32 is retracted, as described hereinabove.

In Figure 8, the bands or stripes applied as described are indicated at B. It should be understood that these bands may be spaced as desired over the length of the capsule. Bands of a width made up of multiples of the width of the edge of the disc 61 may be obtained by applying several stripes without spacing the same. If one or several bands overlap, the width of the resulting stripe will be fractionally greater than the width of an individual band. If, while striping is carried out, the knob 88 is turned, the resulting stripes will be wavy.

Many details of construction and procedure may be varied without departing from the principle of this invention which comprises broadly speaking, the concept of holding a capsule or other rounded object to be striped, resiliently pressing against the capsule while so held, an edge carrying a liquid coloring medium, and effecting relative rotation as between the capsule and the edge. The apparatus may be said to comprise means for rotatably supporting a capsule and means for resiliently and rotatably pressing against the capsule the edge of a disc carrying a liquid coloring medium, the disc being not only rotatable with respect to the capsule but also displaceable lengthwise and transversely thereof. It is therefore not my intention to limit this patent otherwise than necessitated by the scope of the appended claim.

I claim as my invention:

A method of forming an encircling colored stripe on a gelatin capsule which comprises grasping opposed ends of said capsule, rotating said capsule while so grasped, abrading successive contiguous parts of an encircling peripheral capsule area while said capsule is thus grasped and rotated, and applying an aqueous coloring medium to each successive area part as each such area part is being abraded, the force effecting said abrading being applied resiliently and in directions both transverse and generally tangential with respect to said capsule periphery.

ROBERT PAULI SCHERER.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,830,662	Kail	Nov. 3, 1931
1,844,587	McTaggart et al.	Feb. 9, 1932
1,919,386	Steele	July 25, 1933
2,085,389	Purington	June 29, 1937
2,167,589	Schutz	July 25, 1939
2,270,177	Vawryk	Jan. 13, 1942
2,289,263	Hart	July 7, 1942
2,313,891	Rogers et al.	Mar. 16, 1943