No. 789,179. PATENTED MAY 9, 1905.

E. L. SONS.

FORMING MACHINE.

APPLICATION FILED AUG. 19, 1904.

Fig. 1.

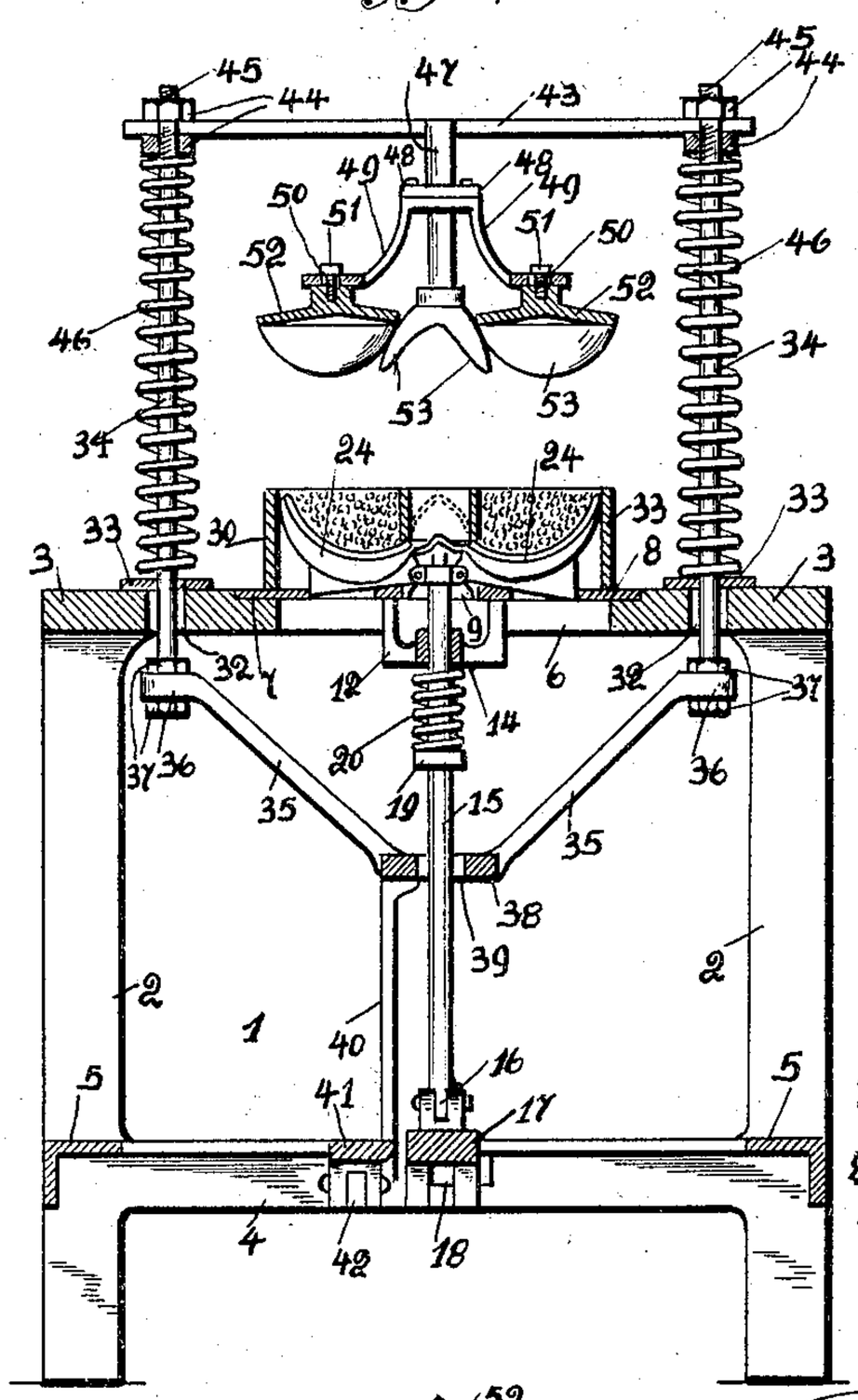


Fig. 2.

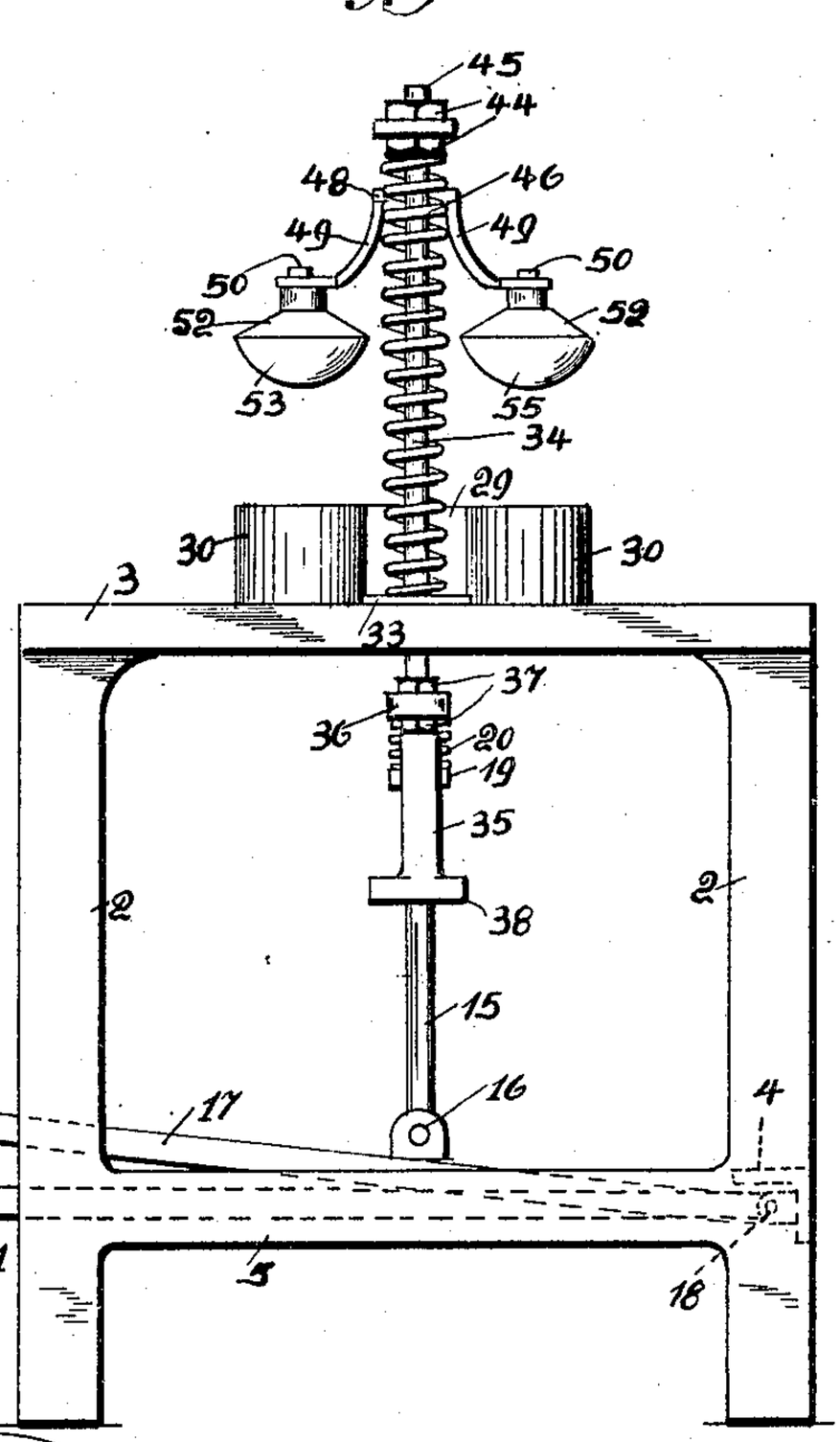
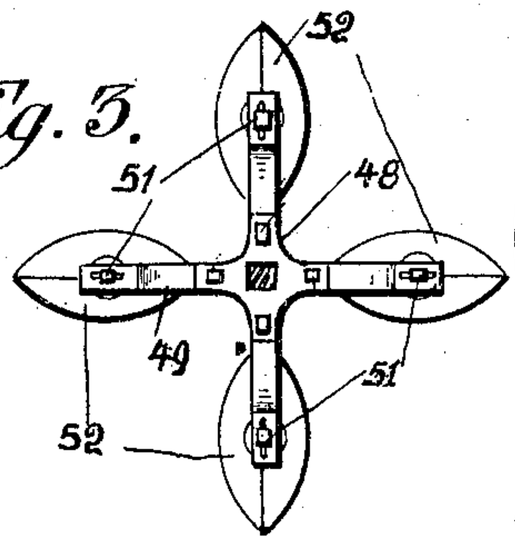


Fig. 3.



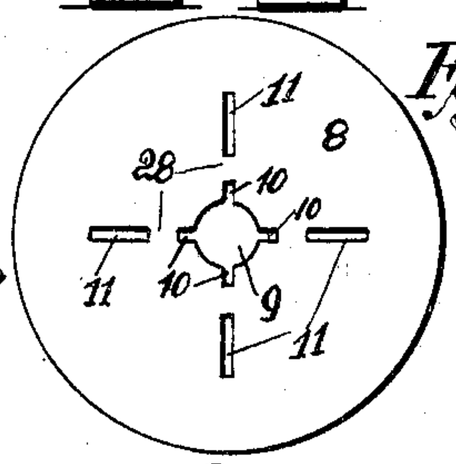


Fig. 4.

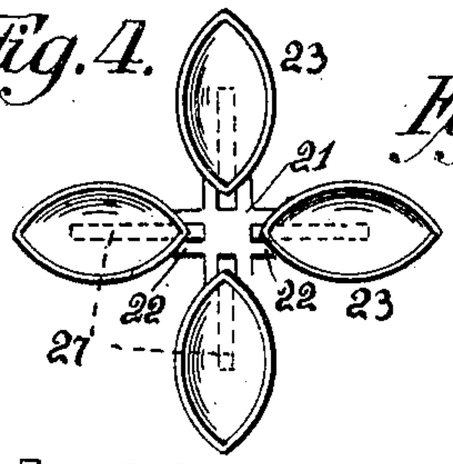


Fig. 5.

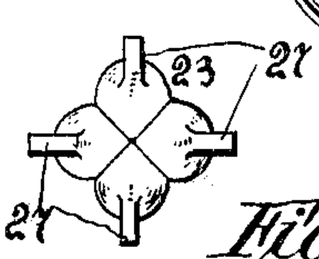


Fig. 6.

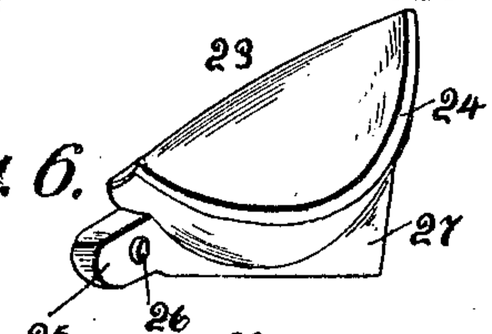


Fig. 7.

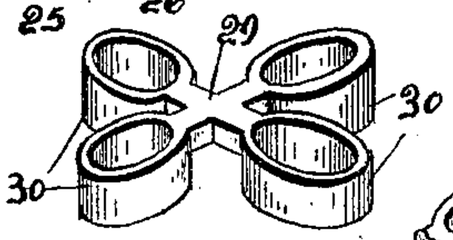


Fig. 8.

Fig. 9.

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No. 789,179. Patented May 9, 1905.

UNITED STATES PATENT OFFICE.

ERNEST L. SONS, OF PITTSBURG, PENNSYLVANIA.

FORMING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 789,179, dated May 9, 1905.

Application filed August 19, 1904. Serial No. 221,385.

To all whom it may concern:

Be it known that I, ERNEST L. SONS, a citizen of the United States of America, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Forming-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention has relation to forming-machines, and more particularly to that type wherein a plurality of dies are employed for forming the material or substance; and the invention has for its object to provide a machine of the above type which will be particularly adapted for forming popcorn balls and the like.

This invention has for another of its objects to provide a machine of the type set forth wherein novel means is provided for first forming sections of a ball and then placing said sections together to form a ball.

The invention as contemplated by me is particularly adapted for forming popcorn balls, and it is a well-known fact that machines of this character have been used wherein the ball was formed in one operation and that it has been impossible to form a ball by said machine that would be of different flavors and colors.

The particular features of my invention reside in the fact that I form a plurality of sections, such as quarters of a sphere, and place these sections together to form the ball or sphere. By so forming the ball I am enabled by the particular construction of the machine to make each section or part of the ball of a different flavor or color from the other, and then by placing said sections or quarters together, forming them in a ball or sphere, I provide a popcorn ball which will be of a number of flavors, and the coloring of each section forming the ball will cause the ball to be extremely attractive in appearance.

The invention finally resides in the novel construction, combination, and arrangement of parts to be hereinafter more fully described and then specifically pointed out in the claims, and, referring to the drawings accompanying this application, like numerals of reference indicate corresponding parts throughout the several views, in which—

Figure 1 is a vertical sectional view of my improved machine. Fig. 2 is a side elevation thereof. Fig 3 is a top plan view of the vertical reciprocating dies. Fig. 4 is a top plan view of the center plate. Fig. 5 is a top plan view of the section-forming dies. Fig. 6 is a detail perspective view of one of the dies. Fig. 7 is a top plan view of the section-forming dies in a closed position. Fig. 8 is a perspective view of the cups employed in connection with the section-forming dies, and Fig. 9 is a detail perspective view of one of said cups.

To put my invention into practice, I employ a table 1, the legs 2 of which support a top 3, and these legs are braced by angle-arms 4 4 and 5 5. The top of the table is provided with a central opening 6, and the top edge adjacent to said opening is cut away, as indicated at 7, to provide a seat for a center plate 8. This center plate is provided with a central opening 9, and communicating with said opening are the radial slots 10 10. In the body portion of the center plate and in alinement with the slots 10 10 are formed slots 11 11, the object of which will be hereinafter more fully described. The center plate supports a depending bracket 12, which carries a collar 14, and through said collar and the central opening 9 of the plate 8 passes a rod 15, the lower end of said rod being pivotally connected, as designated at 16, to a foot-lever 17, which is hinged, as indicated at 18, to one of the angle-bars 4. The rod 15 carries a collar 19, and between this collar and the depending bracket 12 is mounted a spiral spring 20, the ends of which are connected to the bracket 12 and the collar 19.

Upon the upper end of the rod 15, which protrudes through the opening 9 of the center plate, is connected a four-winged spider 21, and in the lugs 22 22 of each wing is pivoted a section-forming die 23. Each one of these section-forming dies consists of a segment-shaped cup 24, and, as illustrated in the accompanying drawings, I have employed four of these cups in connection with the machine, and each segment-shaped cup

is in the form of a quarter of a sphere, whereby, as will be hereinafter more fully described, when said cups are placed together a sphere will be formed. Each section-forming die or cup has formed on its inner end a lug 25, having an aperture 26 formed therein, whereby said die may be pivoted in the lugs 22 22 of the wings of the spider 21. Formed integral with the bottom of the die or cup 24 is a downwardly-extending blade or flange 27, this flange being formed centrally the longitudinal length of said die. Reference will now be had to Fig. 1 of the drawings, wherein I have shown the normal position of these dies, and when in said position the depending flange 27 is adapted to rest within the slots 11 11 of the center plate, a portion of the flange resting upon the neck portion 28 28 of the center plate, which is formed between the slots 11 11 and the slots 10. When the dies or cups 23 are in this position, a spider 29, which carries cups 30, is adapted to be placed over said dies. These cups are carried upon the outer ends of the spider 29, and the spider is connected to said cups or formed integral therewith near the top edge of each cup, as will be clearly seen in Fig. 9 of the drawings, and to facilitate the placing of these cups over the dies 23 the end of the cup adjacent to the spider 29 is cut away, as designated at 31, whereby said cups may span the inner ends of the dies 23.

The top 3 of the table is provided upon each side of the central opening 6 with orifices 32 32, and upon the top of said table and over said orifices are mounted guide-plates 33 33. Passing through said guide-plates and the orifices 32 are the vertically-reciprocating rods 34 34, the lower ends of said rods being connected to a two-armed spider, the arms 35 35 of said spider being bent outwardly, as indicated at 36 36, to receive the lower ends of the rods 34, these rods being secured to said arms by nuts 37 37. The central portion 38 of the spider is provided with an aperture 39, through which the rod 15 passes, and connected to one side of the central portion 38 is a downwardly-extending bar 40. This bar is pivotally connected to a foot-lever 41, which is hinged, as indicated at 42, to the same angle-arm 4 as the foot-lever 17. The upper ends of the rods 34 carry a cross-arm 43, which is secured to the upper end by nuts 44 44, that engage the screw-threaded ends 45 of the rods 34. Between the nuts 44, carried by said rods, and the guide-plates 33 are mounted spiral springs 46. Centrally located upon the cross-arm is a depending bar 47, the lower end of said bar carrying a four-winged spider 48, and secured to each wing of the spider is a depending curved arm 49, the lower end of each arm being bent outwardly upon a line parallel to the top of the table, and the end of each arm is slotted, as indicated at 50, and passing through said slot is a screw 51, to which is connected the reciprocating dies 52. Each one of these dies is formed with depending sides 53 53, and the function of said dies, in connection with the construction previously described, is as follows: Reference will be had to Fig. 1 of the drawings, wherein one of the positions assumed by the machine during the formation of a ball is illustrated. In this figure the cups 30 are shown in position over the section-forming dies 23, and when in this position the substance or material to form the ball is resting upon the section-forming dies 23. Prior to placing said cups 30 in this position they are packed or filled with the material or substance to form the ball, in this case the same being popcorn. They are then placed over the section-forming dies, and the foot-lever 41 is depressed, causing a downward movement of the rods 34 34 through the top 3 of the table, these rods carrying the cross-arm 43, which in turn carries the dies 52. These dies are made of such a size as when they descend they will enter the cups 30 and compress or form the popcorn supported between said cups 30 and upon the section-forming dies 23. The angle between the sides 53 53 of the dies where four of said dies are used corresponds to a right angle, whereby when the popcorn is formed and the dies 52 52 raised the popcorn will be formed with sides lying at an angle of forty-five degrees one to the other and when said dies 52 have compressed the popcorn the section-forming dies 23 will form the popcorn resting therein into a segment of a sphere, as will be hereinafter described. The springs 46 46 will return the cross-arm carrying the dies 52 52 and the foot-lever 41 to their normal position after the rods 34 34 have been manipulated to form the popcorn within the cups 30 30. When the dies 52 52 have assumed their normal position, the spider 29, carrying the cups 30, is removed, and the cups are again ready to be refilled with popcorn. Upon the cups being removed the popcorn carried by each of the section-forming dies is of such a form that they are in position and in condition to be formed into a ball or sphere, and the operation to perform this will now be described. The foot-lever 17 is now pressed, which will throw the rod 15 downwardly through the central portion 38 of the spider, which is connected to the rods 34 34. As the rod 15 descends it carries with it the spider 21, having pivoted in the lugs comprising the wings of the said spider the section-forming dies, and as said rod descends the section-forming dies are raised gradually, the flanges 27 of said dies passing down through the slots 10 10, and the central opening 9, with which said slots communicate, is of just a sufficient size to cause the section-forming dies to close

to the position illustrated in Fig. 7 of the drawings, the downward movement of the rod 15 and the section-forming dies being limited by the spider 21 contacting with the collar 14 of the bracket 12. When this operation is performed, the lever 17 is released, the spring 20 returning the rod 15 to its normal position, this movement of said rod permitting the section-forming dies to open to the position shown in Figs. 1 and 5 and permitting the ball or sphere which has been formed to be removed, said ball or sphere resting upon the spider 21 when the section-forming dies have been opened. When the section-forming dies are opened, the flanges 27 will again rest in the slots 11 11 of the center plate, and said section-forming dies will be in position to again receive popcorn to be formed into balls, as above described.

From the foregoing description it will be observed that during the operation of forming the ball of popcorn that each section of the ball comprising said ball may be made of a different flavor or color from the other section, the popcorn being prepared in the cups 30. By so forming the ball of different flavors and colors an artistic and attractive ball may be produced, and while I have herein shown the ball as being formed of four sections it is obvious that I may employ sufficient section-forming dies 23, dies 52, and cups 30 which will enable me to form the ball of more than one section, and I do not care to limit myself to the specific means shown for forming said balls, but may employ any other mechanism which will accomplish the desired results.

What I claim, and desire to secure by Letters Patent, is—

1. A machine of the type set forth comprising a table, segment-shaped dies supported upon said table, dies mounted above said table, means for moving said dies into engagement with said segment-shaped dies, means to return said dies to their normal position, means to bring said segment-shaped dies into engagement with each other, and means to return said segment-shaped dies to their normal position.

2. A machine of the type set forth comprising a table, a vertically-reciprocating rod mounted upon said table, segment-shaped dies pivoted to said rod, dies mounted above said segment-shaped dies, means for reciprocating said dies, and means to bring said segment-shaped dies into engagement with each other, and to return them to their normal position.

3. In a machine of the type described, the combination of a vertically-reciprocating rod, a plurality of segment-shaped dies, each pivotally connected to said rod, a plurality of cups adapted each to surround one of said dies, means for compressing material into the cups and upon the dies, and means for reciprocating the said rod to close the dies together, substantially as described.

4. In a machine of the type described, the combination of a table, a plate mounted on said table and formed with a central opening, and radially-disposed slots, a vertically-reciprocating rod passing through said opening, and means for reciprocating said rod, with a plurality of segment-shaped dies each pivotally connected to said rod, each die being formed with a vertical flange adapted to enter one of said slots, substantially as described.

5. A machine of the type set forth, comprising a table, a reciprocating rod arranged at the center of the table, means for reciprocating said rod, segment-shaped dies pivotally connected to said rod, means whereby when the rod is reciprocated the said dies will be closed, two vertically-reciprocating rods arranged on opposite sides of said table, a cross-piece connecting said last-named rods, dies carried by said cross-piece, and cups adapted to surround the segment-shaped dies when the latter are in open position.

6. A machine of the type set forth comprising a table, segment-shaped dies supported upon said table, cups surrounding said dies, dies supported above the last-named dies, means to bring said dies in engagement with said dies, means to close said segment-shaped dies when said cups are removed, substantially as described.

7. A machine of the type set forth comprising a table, a reciprocating rod mounted within said table, segment-shaped dies pivotally connected to said rod, means whereby when said rod is reciprocated said dies will be closed, reciprocating rods mounted at the sides of said dies, dies supported by said rods, cups adapted to be placed over said segment-shaped dies when in an open position, and means to return said dies and said segment-shaped dies to their normal position, substantially as described and for the purpose set forth.

In testimony whereof I affix my signature in the presence of two witnesses.

ERNEST L. SONS.

Witnesses:
H. C. EVERT,
E. E. POTTER.