

No. 816,694.

PATENTED APR. 3, 1906.

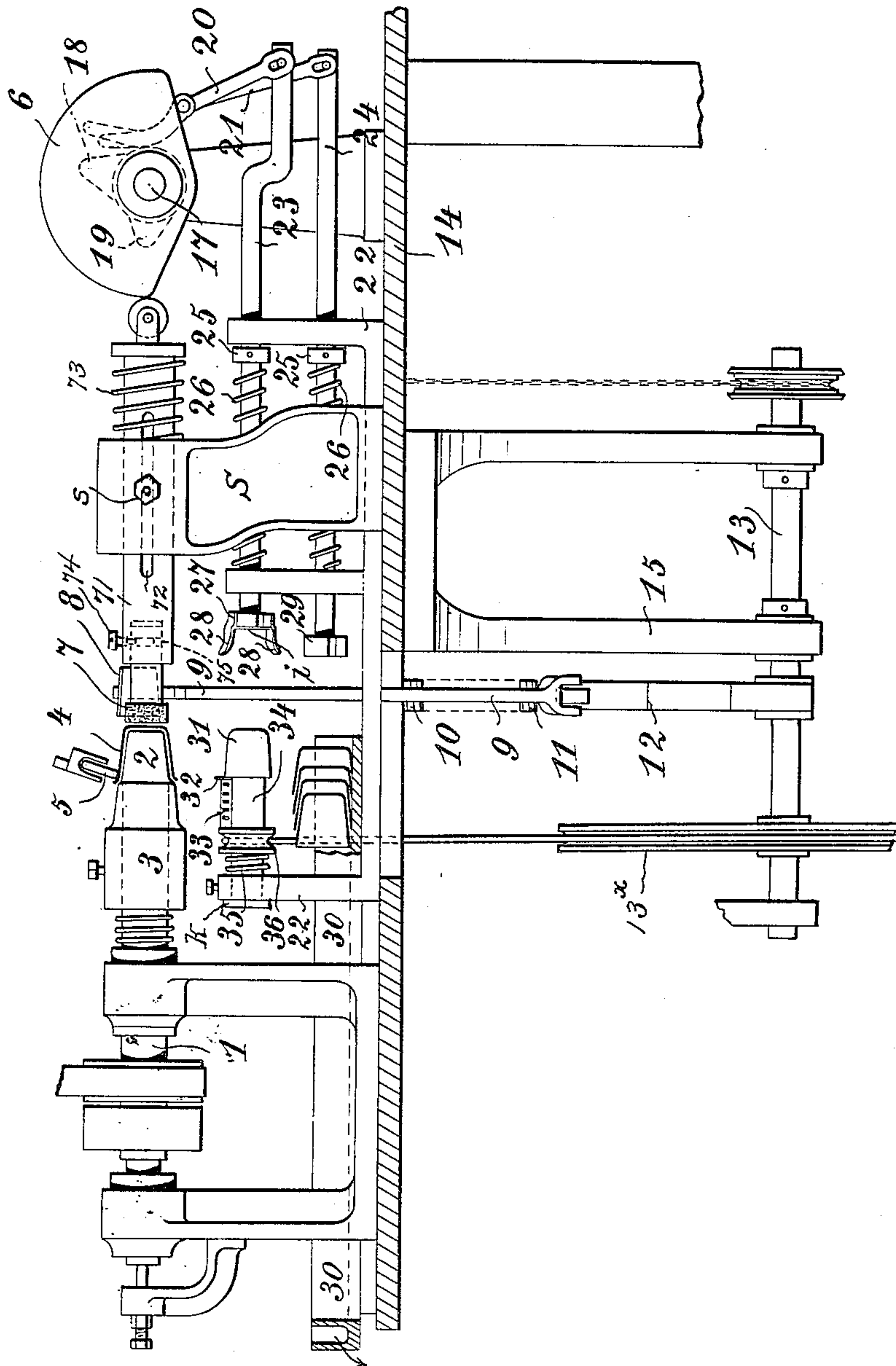
E. WATZKE.

MACHINE FOR SPINNING, TRIMMING, AND STACKING CAPSULES.

APPLICATION FILED JAN. 5, 1904.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

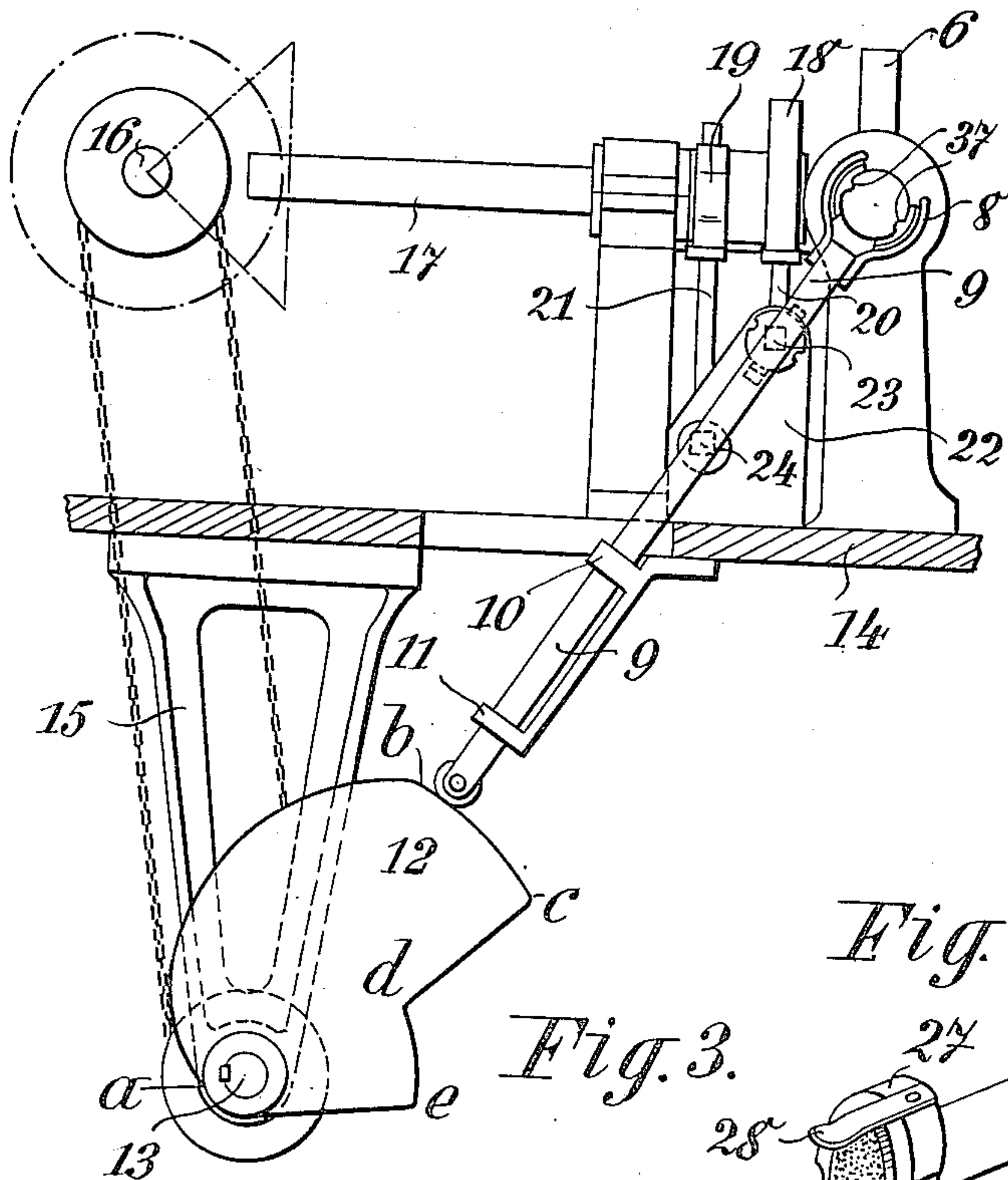
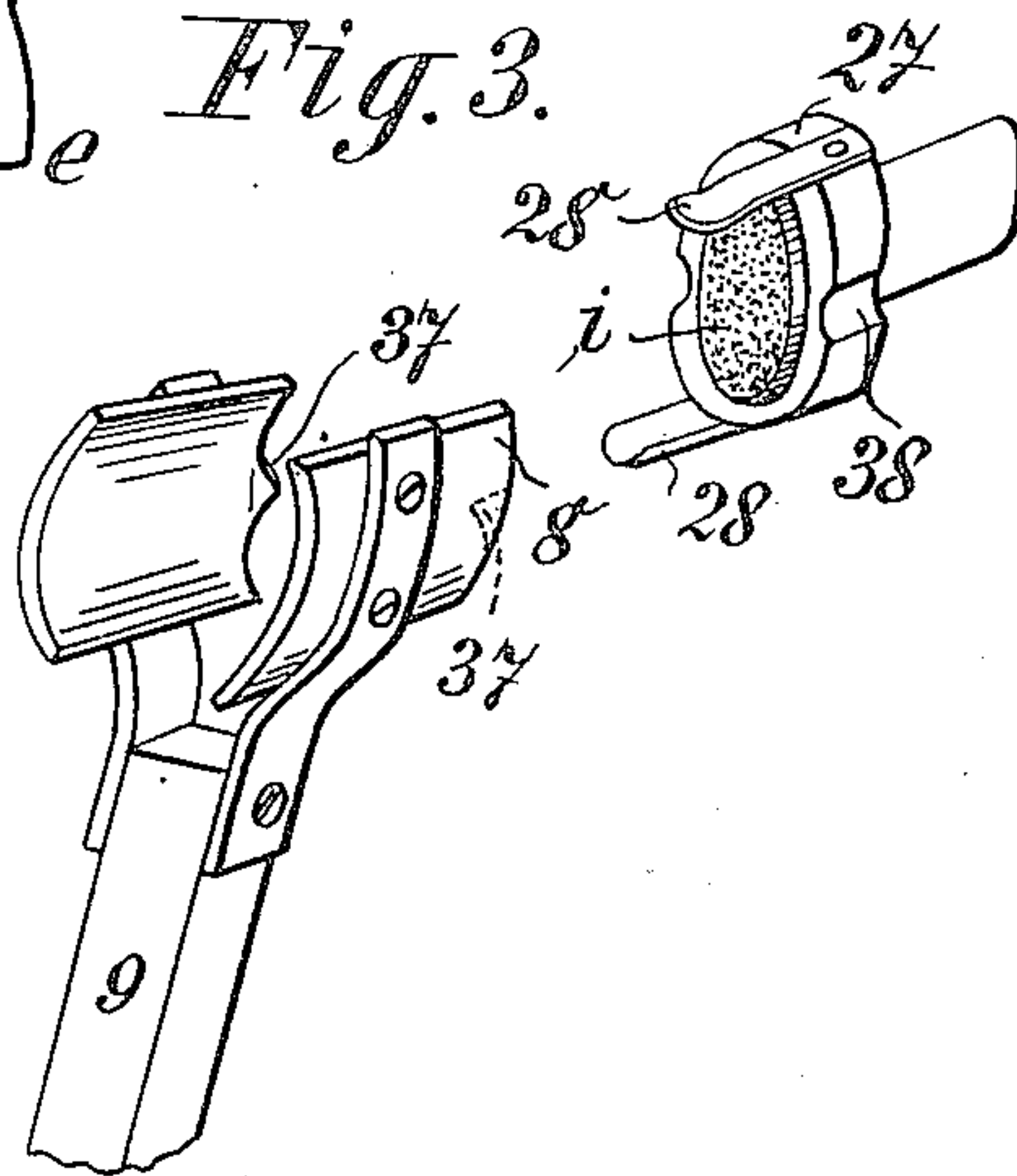


Fig. 4.

Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

EDUARD WATZKE, OF FRIEDBERG, AUSTRIA-HUNGARY, ASSIGNOR OF
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MACHINE FOR SPINNING, TRIMMING, AND STACKING CAPSULES.

No. 816,694.

Specification of Letters Patent.

Patented April 3, 1906.

Application filed January 5, 1904. Serial No 187,768.

To all whom it may concern:

Be it known that I, EDUARD WATZKE, a subject of the Emperor of Austria-Hungary, residing at Friedberg, in the Province of Styria, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Machines for Spinning, Trimming, and Stacking Capsules; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to mechanism which has for its object to feed cap-shaped blanks—for example, bottle-capsules ejected from a spinning device—automatically to an edge-trimming device for cutting off the irregular edge of the cup and after the cutting off of the edge depositing the said cups pushed, packed, or stacked one in the other onto any suitable support.

This improved mechanism consists, essentially, in a fork which is shaped so as to correspond in form with the blank and which can be moved by a stepped cam, which fork in one of its end positions receives the ejected blank, and two successively-actuated slides, of which one pushes the blank which is transferred thereto by the fork onto the blank or cup carrier of the edge-trimming device, which is constructed in a known manner, and after cutting off of the edge feeds it back again into the fork by means of spring-arms, which fork then reaching its other end position comes in front of the second slide, which by means of its end made in the form of a punch pushes the finished blank out of the fork into a channel onto the blank already therein, in which arrangement the said blanks are moved forward as a string or series on the place onto which they are deposited.

In the accompanying drawings, Figures 1 and 2 are respectively a side elevation and a transverse section of my improved feeding and packing or stacking mechanism arranged in combination with a spinning device serving for the manufacture of bottle-capsules. Figs.

3 and 4 show two parts of this feeding device in perspective.

The machine embraces appliances for spinning capsules from previously-formed cup-shaped sheet-tin or tinfoil and may be of any desired character. These appliances may, for instance, be organized as shown and described in my copending application for patent, Serial No. 136,490, filed December 24, 1902, and comprise a rotary spinning mandrel or spindle 1, whose head 2 conforms to the finished capsule. In the case shown said head has the form of the frustum of a cone. The spindle 1 carries the supporting and ejector sleeve 3, revoluble with and movable axially on said spindle, said sleeve being acted on by a spring, against the stress of which it is moved back by the spinning-rollers and forced forward again by said spring to eject the spun capsule 4 after the rollers have been moved out of contact with said capsule.

In line with the spinning-spindle is arranged a pusher or follower 71, movable longitudinally in a bearing in the standard S and held against rotary motion by a screw-bolt s, extending through a longitudinal slot 72 in said follower, which is retracted by a spring 73 and moved toward the head 2 of the spinning-mandrel by a cam 6 on a shaft 17. At its inner end the follower 71 is provided with a revoluble yielding or elastic head 7, the stem of which is fitted in a socket in said inner end of the follower and held against endwise motion by a screw-bolt 74 engaging a peripheral groove 75 in said stem, said head 7 serving to hold the capsule on the head 2 of the spinning-spindle and rotating therewith, as fully shown and described in my copending application.

The object of providing the follower 71 with a yielding or elastic revoluble head 7 is fully disclosed in Letters Patent of the United States granted to me under date of October 13, 1903, No. 741,324—namely, to prevent the effacing or obliteration of an impression in the head of the cup-shaped capsule-blank during its formation.

As soon as the spinning is completed the spinning-rollers 5 are raised from the work, while the head 7 on the pusher or follower 71 a short time before has been removed by

spring-pressure from the top or cover of the capsule, so that the sleeve 3, which has now been released, can effect the ejection of the finished capsule from the end 2 of the spinning-mandrel by the pressure of its spring.

Fig. 1 shows the position of the parts immediately before the completion of the operation of spinning.

The mechanism which feeds the ejected blank to the edge-trimming device (which is of known construction) for cutting off the irregular edge thereof and afterward deposits the said blank, for example, into a suitable receptacle comprises a carrier provided at one end with a grasping and feeding fork 8, which is shaped to correspond with the form of the finished capsule and which consists of a sleeve having two slots. The stem or supporting-arm 9 of this sleeve is preferably arranged obliquely, as shown, and can be moved longitudinally in fixed guides 10 and 11. The lower end of this arm 9 rests either directly or by means of a roller on a stepped cam 12, of which the shaft 13 turns in a bearing 15, mounted on the under side of the table 14 of the machine, and is driven by means of chain or other suitable driving-gear from a rotating shaft 16 at the same angular velocity as the shaft 17 of the cam 6. On the shaft 17 are mounted two cams 18 and 19, which act either directly or by means of the levers 20 and 21, as shown, on two corresponding slide-bars 23 and 24, which can slide parallel to the spinning-mandrel 1 in a guide-bracket 22, but cannot rotate. The paths of these slide-bars extend through the center line of the arm 9 of the fork or through the path thereof. The slide-bars 23 and 24 are each provided with an adjustable collar 25 and with a spring 26, which brings back the corresponding slide-bar to its original position (toward the right in Fig. 1) as soon as the cam 18 or 19, respectively, ceases to act. The slide-bar 23, arranged nearer to the spinning-spindle, has at its end a head 27, which is of such dimensions that it can pass freely through the opening or jaw of the fork 8, approximately in front of it. This head, which serves for pushing the capsule 4 for the time being in the fork onto the edge-trimming device and then for bringing it back again into the fork, is provided for this purpose with two or more spring-arms 28, arranged around its periphery, and also, if desired, with an insert *i* of india-rubber, as shown in Fig. 4, in order not to damage the impression on the top of the capsule. The arms 28 themselves can also be covered on the inside with india-rubber or other suitable yielding material in order to permit a certain withdrawal of the capsule after the edge has been cut off. The second slide-bar 24, lying beneath slide-bar 23, acts, by means of its head part 29, as an ejector which transfers

the finished capsule in the fork 8, while the latter is in its lowest position, out of the said fork into a channel 30 arranged in front of it.

In front of the upper slide-bar 23 and coaxially therewith is arranged the edge-trimming device, which consists of a carrier made of similar form to the spun capsule and in the present case of a cone 31, which is, however, shorter than the blank, so that on pushing the blank onto the cone the edge of the blank projects beyond that of the cone. The latter is provided at this edge with a projecting knife 32 and adjacent thereto with a radially-mounted stripper 33 for the purpose of preventing the rolling inward of the cut-off edge of the capsule. The spindle 34 of the cone 31 (which spindle is rotatable in the bearing-bracket 22 and can make a slight movement in an axial direction and is pressed by means of a spring 35 against the fork 8) is provided with a band or chain roller 36, which is set in rapid rotation from any rotating part of the machine. In practice the spindle 34 may be provided at its inner end with an abutment—for instance, in the form of an annular flange *k*—to limit its movement toward the right, Fig. 1. The spindle 34 may be driven, as stated, from any rotating element of the machine, either from the prime motor (not shown) which drives the spinning-spindle or from the shaft 13, suitably prolonged and carrying a chain or belt pulley 13^x of the required speed.

The method of operation of the arrangement above described is as follows: As soon as the eccentric part *a b* of the stepped cam 12 has passed the end of the stem 9 of the carrier the fork 8 is raised to its highest position, at which point it stands coaxially with the spinning-mandrel 1 and surrounds the head 7, which is still in contact with the spun capsule, Fig. 1. While the concentric part *b c* of the stepped cam moves past the end of the stem 9 the fork 8 remains immovable in the said highest position, during which time the head 7 is withdrawn and the spun capsule 4 is ejected by the sleeve 3 (which has been released on the raising of the spinning-rollers 5) and is thereby pressed into the fork 8 in front of it, whereupon the stem 9 falls from the step *c* of the cam 12 directly onto the concentric part *d e* thereof. The fork 8, containing the capsule, is now in the mid-position and is coaxial with the slide-bar 23 and the edge-trimming device 31 32. While the stepped cam 12 moves from *d* to *e* the fork remains in its mid-position, during which time the slide-bar 23 is moved forward by the cam 18 on the shaft 17, so that the head 27, by means of the spring-arms 28, simultaneously pushes the capsule 4 onto the cone 31 of the edge-trimming device, in which operation the capsule 4, clamped between the arms 28 and fitting loosely on the smooth

cone 31, does not rotate with the said cone, so that the knife 32 cuts off the edge of the capsule projecting beyond the edge of the cone. Directly after this the head 27 is again drawn back, in which operation it carries the now finished capsule with it by means of the spring-arms 28 and brings it back again into the fork 8, which is still in the mid-position. The head 27 goes back still farther and releases itself from the capsule retained in the conical fork. In order that the capsule shall not be forcibly drawn back through the fork in the event of the pressure of the arms 28 28 being too great, the said fork is provided at the edge turned toward the slide-bar 23 with two or more inwardly-extending projections 37, Fig. 3, while the head 27 has corresponding grooves 38 38 on its exterior, which permit the unimpeded passage of the head 27 through the opening of the fork. After complete withdrawal of the head 27 the stem 9 falls from the second step at *e*, so that the fork 8, containing the finished capsule, reaches its lowest position, whereupon the ejector 24 is moved forward by the cam 19 on shaft 17, so that the head 29 of the ejector pushes the capsule out of the fork and feeds it into the channel 30, where the capsule slips onto the end capsule of the series of capsules which are already pushed or packed one in the other in the channel. The series or string of capsules is consequently moved gradually forward along the receptacle, (toward the left in Fig. 1.)

I claim—

1. In a sheet-metal-shaping machine, shaping devices, a trimmer, a carrier, means to transfer the shaped article to the carrier and means to transfer said article from the carrier to the trimmer.
2. In a sheet-metal-shaping machine, a trimmer, a carrier, means to feed the shaped article to the carrier, means to transfer said article from the carrier to the trimmer and means to return the article to the carrier after being trimmed.
3. In a sheet-metal-shaping machine, a trimmer, a receiver for the finished article, a carrier, means to feed the shaped article to the carrier, means to move said carrier first to the trimmer and then to the receiver, means to transfer the shaped article from the carrier to the trimmer and return said article after being trimmed to the carrier, and means to eject the finished article onto the receiver.
4. In a machine for shaping sheet-metal hollow articles, a receiver for the finished article, a carrier, means to feed the shaped article to the carrier, and means to eject the article from the carrier and nest or telescope the same on the receiver.
5. In a machine for shaping hollow articles, a trimmer, a receiver, a carrier, means to

feed the shaped article to the carrier, means to transfer the article therefrom to the trimmer, means to return the trimmed article to the carrier, means to move the carrier from the trimmer to the receiver and means to eject the finished articles from the carrier and nest or telescope the same on the receiver.

6. A machine for making bottle-capsules, comprising an edge-trimmer, a carrier, means to move it to and from the edge-trimmer, means to feed the shaped capsule to said carrier, means to transfer said capsule from the carrier to the edge-trimmer and return it to said carrier after having its edge trimmed.

7. A machine for making bottle-capsules, comprising an edge-trimmer, a receiver for the finished article, a carrier, means to move the same to and from said trimmer and to and from said receiver, means to feed the shaped article to the carrier, means to transfer the shaped capsule from the carrier to the trimmer and to return the trimmed capsule to said carrier and means to eject the trimmed capsules from the carrier and nest or telescope the same on the receiver.

8. In a machine such as described, the combination with spinning appliances comprising a revoluble spindle and means to strip the spun capsule off said spindle, edge-trimming appliances comprising a revoluble cutter, a carrier adapted to receive the spun capsule ejected from the spinning-spindle, and mechanism to move said carrier from said spindle to the edge-trimming appliances; of mechanism to take the spun capsule from the carrier and present its edge to the aforesaid cutter, substantially as set forth.

9. In a machine such as described, the combination with spinning appliances comprising a revoluble spindle and means to strip the spun capsule off said spindle, edge-trimming appliances comprising a revoluble cutter and a conical support for the capsule, a carrier comprising a slide-bar having a receiver for the capsule at one end consisting of two tapering segments; of mechanism to move the carrier from in front of the spinning-spindle, in front of the cutter, and means for taking the spun capsule from the carrier and presenting it to the cutter, for the purpose set forth.

10. In a machine such as described, the combination with spinning appliances, comprising a revoluble spindle and means to strip the spun capsule off said spindle, edge-trimming appliances comprising a revoluble cutter, and a receiver for the finished capsules; of a carrier adapted to receive the spun capsule stripped off the spinning-spindle, mechanism to move said carrier from said spindle to the edge-trimming appliances and then to said receiver, mechanism to take the spun capsule from the carrier and present its edge to the aforesaid cutter when said carrier has

moved to the edge-trimming appliances and to return the trimmed capsule to said carrier, and mechanism to eject the trimmed capsule from the carrier when the latter has moved to the aforesaid receiver, substantially as set forth.

11. In a machine such as described, the combination with spinning appliances comprising a revoluble spindle and means to strip the spun capsule off said spindle, edge-trimming appliances comprising a revoluble cutter and a support for the capsule, and a receiving-channel; of a carrier adapted to receive the spun capsule, mechanism to move said carrier first in front of the edge-trimming appliances and then in front of the receiving-channel, mechanism to take the spun capsule from the carrier, move it onto its support and present its edge to the aforesaid cutter and move the trimmed capsule back to the carrier while in front of the edge-trimming appliances, and mechanism to eject the finished capsule from the carrier into the aforesaid channel while said carrier is in front of said channel, whereby the capsules are nested or telescoped, and mechanism to return the carrier to its normal position in front of the spinning-spindle, substantially as set forth.

12. In a machine such as described, the combination with spinning appliances comprising a revoluble spindle having a conical head and means to strip the spun capsule off said head; edge-trimming appliances comprising a revoluble spindle having a conical head shorter than the capsule and a radial cutter at the base of said head, a receiving-channel for the finished capsule and a carrier constructed to receive the capsule stripped off the head of the spinning-spindle; of mechanism to move said carrier from said spindle first in front of the head of the edge-trimming spindle, then in front of the receiving-channel and back in front of the spinning-spindle, mechanism to take the spun capsule from the carrier, transfer it to and hold it stationary on the head of the edge-trimmer spindle and then take it back to the carrier while the latter is in front of said spindle, and an ejector operating to eject the finished capsule from the carrier while the latter is in front of the aforesaid receiving-channel, substantially as set forth.

13. In a machine such as described, the combination with spinning appliances comprising a revoluble headed spindle and means to strip the spun capsule off said spindle, edge-trimming appliances comprising a revoluble spindle provided with a head shorter than the head of the spinning-spindle and with a radial cutter at the base of said head and a receiving-channel for the finished capsules, said edge-trimming spindle arranged below the spinning-spindle and said channel arranged below the edge-trimming spindle in

different vertical planes but parallel to one another; of a carrier adapted to receive the capsule stripped off the spinning-spindle, mechanism to move said carrier first to the edge-trimmer spindle and then to the receiving-channel and back to the spinning-spindle, means to take the spun capsule from the carrier, transfer it to the head of the edge-trimmer spindle, and take it back to the carrier while the latter is in front of said spindle, and means to eject the finished capsule from the carrier while the latter is in front of the receiving-channel, substantially as set forth.

14. In a machine such as described, the combination with the spinning appliances comprising a revoluble spindle, means to strip the spun capsule therefrom, a spring-retracted follower in line with said spindle and means to move the follower toward the spindle against the stress of its spring, the spindle 34 and the receiving-channel 30; of a forked carrier adapted to receive the spun capsule stripped off the spinning-spindle, mechanism to move the carrier from in front of the spinning-spindle when the follower has been retracted, first in front of the spindle 34, then in front of the channel 30 and back in front of the spinning-spindle, means to take the spun capsule from the fork of the carrier to the spindle 34 and hold it stationary thereon until the edge of the capsule is trimmed off, and then return the finished capsule to said fork while the latter is in front of said spindle 34, and means to eject the finished capsule from the carrier-fork while the latter is in front of the receiving-channel, substantially as set forth.

15. The combination with the spindle 1, its spring-actuated sleeve 3, the spring-retracted follower 7, the cam 6, the spindle 34, means to rotate both said spindles and cam, the channel 30, the carrier-stem 9 having forked head 8 and the revoluble cam 12 acting on said stem and constructed to move the forked head of said carrier from in front of the spindle 1, when follower 7 is retracted, in front of spindle 34, then in front of channel 30 and back in front of spindle 1; of the spring-actuated bar 23 having a head comprising gripping-arms 28, the spring-retracted ejector-bar 24 and mechanism to successively move said bar 23 and ejector 24 against the stress of their springs first to take the spun capsule from the fork of the carrier, transfer it to spindle 34, and return it to said fork while the latter is in front of such spindle, and to eject the finished capsule from the carrier-fork into the aforesaid channel when said carrier is in front of the channel, substantially as and for the purpose set forth.

16. The combination with the edge-trimmer spindle 34 having head 31, the carrier-stem 9 having a tapering fork 8 provided at its outer end with inwardly-converging lugs

37 and means for imparting periodical recti-
linear movements to the carrier-stem to and
from spindle 34; of the bar 23 coaxial with
spindle 34 and having a head provided with
5 gripping-jaws and with peripheral grooves
in line with the aforesaid lugs 37 on the car-
rier-fork, and means to reciprocate the bar
23 to move its head through the fork to the
spindle 34 and then retract said bar to move

its head out of the fork of the carrier, for the 10
purpose set forth.

In testimony that I claim the foregoing as
my invention I have signed my name in pres-
ence of two subscribing witnesses.

EDUARD WATZKE.

Witnesses:

JOSEF RUBARCH,
ALVESTO S. HOGUE.