

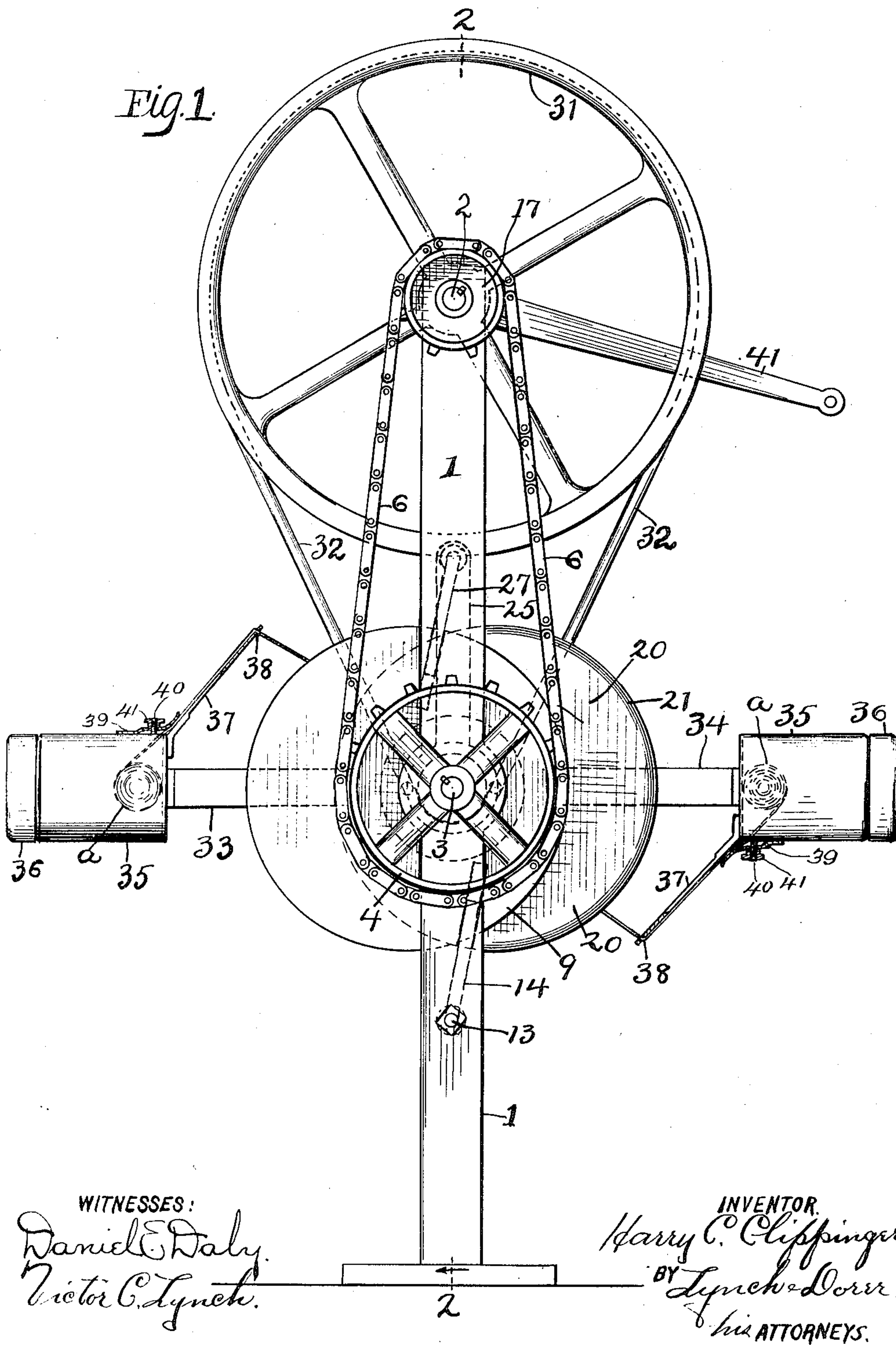
No. 862,389.

PATENTED AUG. 6, 1907.

H. C. CLIPPINGER.  
DEVICE FOR FORMING BALLS FROM YARN.

APPLICATION FILED APR. 27, 1903.

3 SHEETS—SHEET 1.



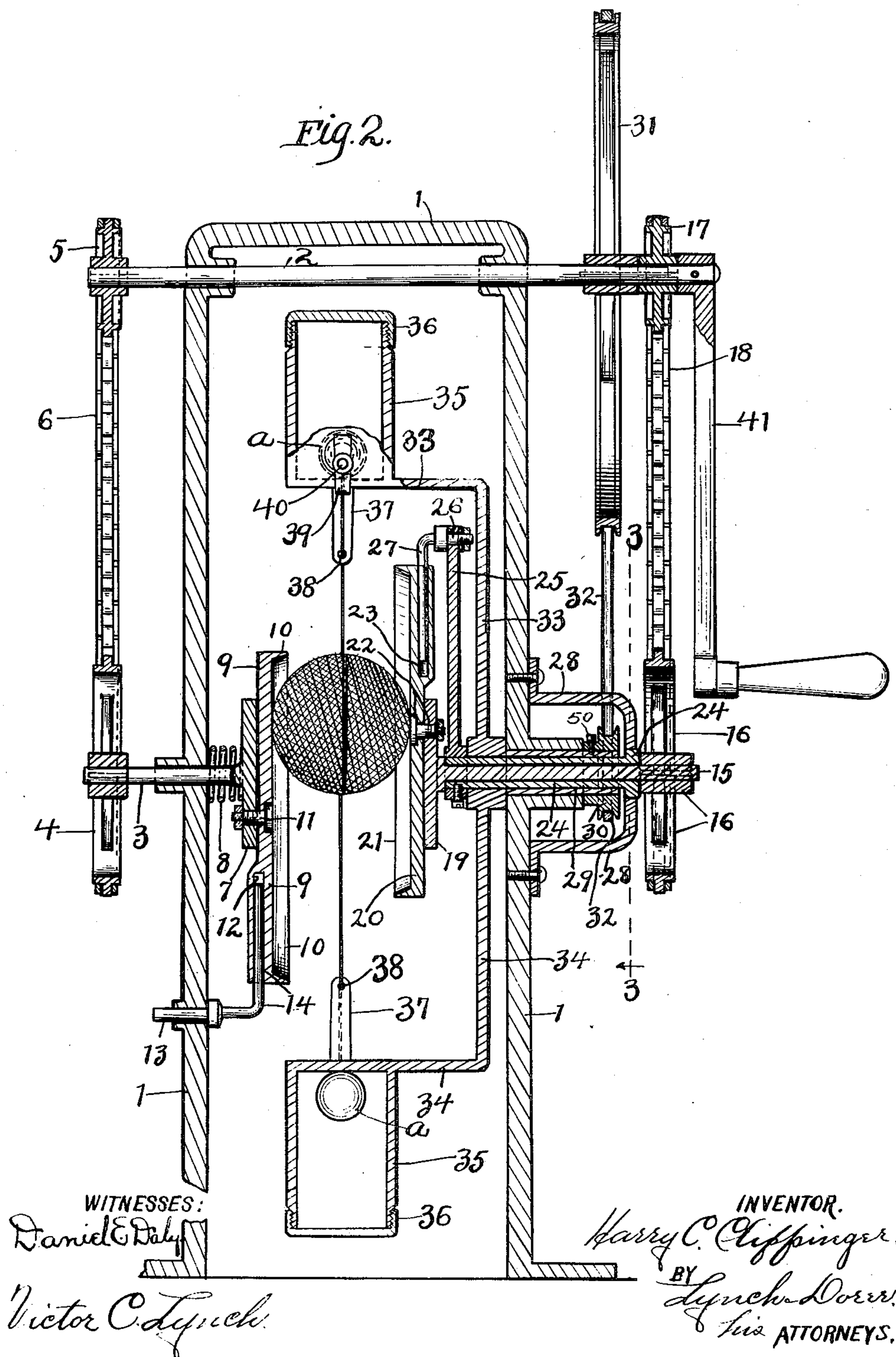
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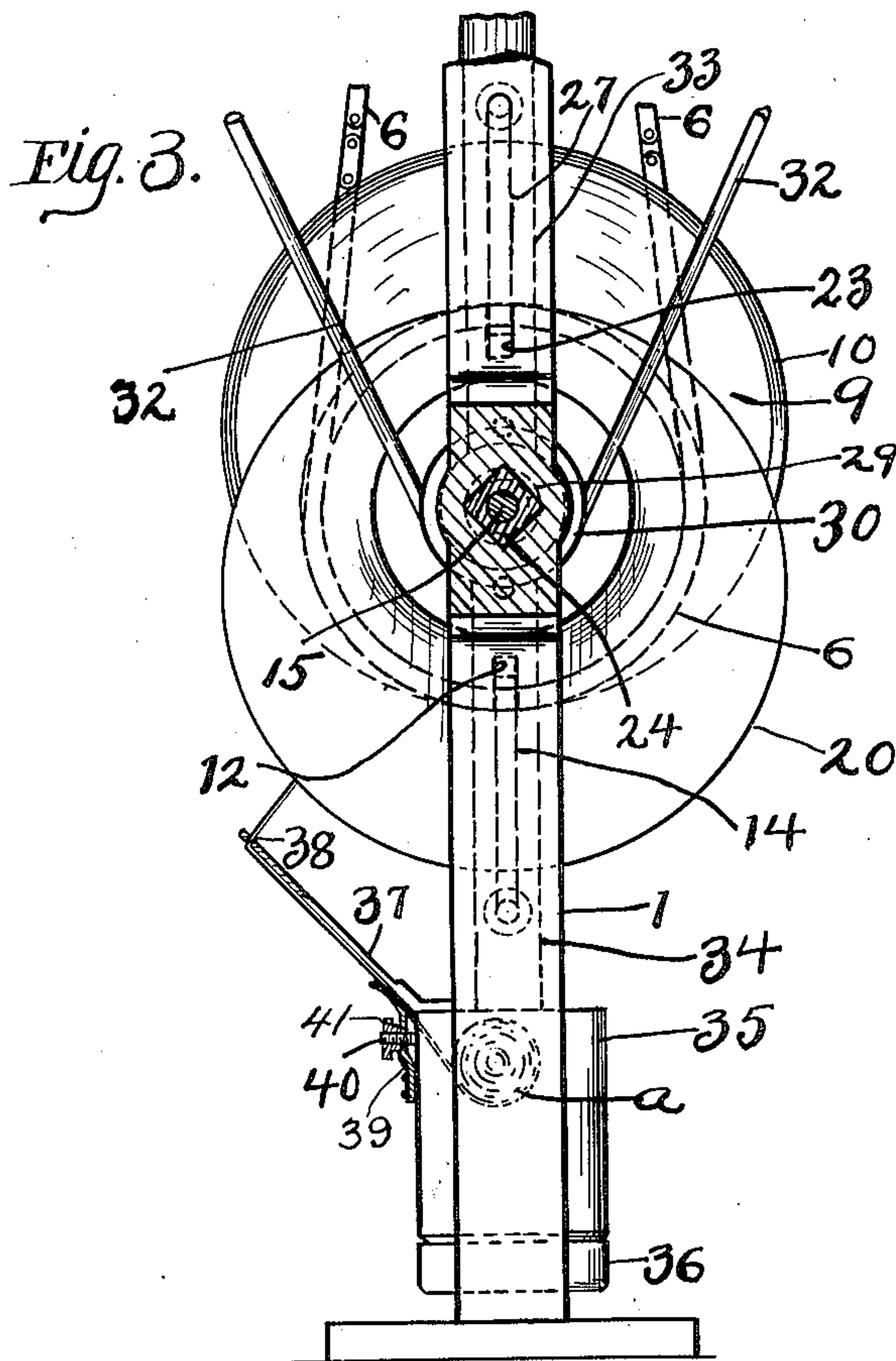
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3 SHEETS—SHEET 3.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

HARRY C. CLIPPINGER, OF AKRON, OHIO.

## DEVICE FOR FORMING BALLS FROM YARN.

No. 862,389.

Specification of Letters Patent.

Patented Aug. 6, 1907.

Application filed April 27, 1903. Serial No. 154,376.

*To all whom it may concern:*

Be it known that I, HARRY C. CLIPPINGER, a citizen of the United States of America, residing at Akron, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Devices for Forming Balls from Yarn, Thread, &c.; and I 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 pertains to make and use the same.

This invention relates to improvements in ball-machines.

The object of this invention is to provide a machine of this character especially adapted for forming compact spherical shaped bodies from twine or similar material, and in particular it consists in providing a machine for forming a compact fibrous cover on a rubber core or other spherical shaped body in order to produce a golf ball.

My invention therefore consists in providing new means for holding the core and imparting a rolling, gyrating motion thereto and new and improved means for holding the material which is to form the cover on the core and winding the same upon the core.

My invention particularly consists in providing two plates arranged to support the core of the ball between their adjacent surfaces and mounted so that the centers thereof can be caused to move in a circular path while the plates themselves do not revolve and means for revolving the material from which the ball is to be formed around the core.

My invention further consists in the features of construction and combination of parts, hereinafter described in the specification, pointed out in the claims and illustrated in the drawings.

In the accompanying drawings, Figure 1 is a side elevation of my machine. Fig. 2 is a central section on line 2—2, of Fig. 1. Fig. 3 is a section on line 3—3, Fig. 2, with the disks for holding the core in a different position.

Again referring to the drawings, 1 represents the frame of the machine, in the upper part of which is journaled a shaft 2. Below the shaft 2 in one side of the frame 1 is mounted a short shaft 3 arranged to slide in and out in its mounting. On the outer end of the shaft 3 is keyed a sprocket wheel 4. On the shaft 2 above the sprocket wheel 4 is keyed a smaller sprocket wheel 5. A chain 6 forms an operative connection between the sprocket wheels 4 and 5. On the inner end of the shaft 3 and preferably formed integral therewith is arranged a circular head 7. On the shaft 3 between the side of the frame 1 and the head 7 is mounted a spring 8 which exerts a constant pressure on the head 7 tending to shove it towards the center line of the frame 1. A circular plate or disk 9 which is preferably provided with a flange 10 is se-

cured to the head 7 by means of a bolt 11 which passes through the center of the plate 9 and through a point outside of the center of the head 7. The bolt 11 does not clamp the plate 9 to the head 7 but serves as a crank pin for connecting them. In the plate 9 is formed a radial bore 12. A pin 13 is journaled in the side of the frame 1 below the shaft 3 so that it is free to slide in its mounting. From this pin 13 an arm 14 extends up at a right angle and enters the bore 12 formed in the plate 9.

In the opposite side of the frame 1, in line with the shaft 3, is arranged a shaft 15. On the outer end of the shaft 15 is keyed a sprocket wheel 16. On the shaft 2 above the sprocket wheel 16 is keyed a sprocket wheel 17 which is operatively connected with the sprocket wheel 16 by means of a chain 18. On the inner end of the shaft 15 and preferably formed integral therewith is arranged a head 19. A circular plate or disk 20, which is preferably provided with a flange 21 is operatively secured to the head 19 by means of a bolt 22, which serves as a crank pin. In the plate 20 is formed a radial bore or slideway 23. On the shaft 15 is arranged a sleeve 24. To the inner end of this sleeve is secured an arm 25. A pin 26 is journaled in the arm 25 and an arm 27 is formed at a right angle to said pin and extends down into the bore or slideway 23 formed in the plate 20. The outer end of the sleeve 24 is squared and is supported in a bracket 28 which prevents the said sleeve 24 from rotating. On the sleeve 24 is arranged a sleeve 29. On the outer end of the sleeve 29 is secured a pulley 30 by a screw 50. On the shaft 2 above the pulley 30 is keyed a pulley 31 which is operatively connected with the pulley 30 by a belt 32. On the inner end of the sleeve 29 and preferably formed integral therewith are arranged two arms 33 and 34 respectively, at diametrically opposite sides of said sleeve. The ends of the arms 33 and 34 are bent at a right angle and to each of the said arms is secured a receptacle 35 which is preferably provided with a removable top 36. These receptacles are designed for holding the thread *a* which is to form the cover of the ball together with a solution of rubber or other suitable cement. A spring arm 37 which has an eye 38 is secured to each of the receptacles 35 and serves to guide and steady the thread as it is fed onto the ball. These spring arms also take up any slack and keep the thread taut while it is being wound on the ball. A flat spring 39 is secured on the side of each receptacle 35 and is arranged to press against the spring arm 37 so as to serve as a tension device to regulate the feed of the thread. A screw threaded pin 40 is secured on each receptacle and passes up through the spring 39. A nut 41 is arranged on the pin 40 to regulate the pressure of the spring 39.

The operation of this device is as follows:—When the shaft 2 is rotated it actuates the shafts 3 and 15 through the operative connection of the sprocket wheels and



chains. As the heads 7 and 19 are revolved they cause the centers of the respective plates 9 and 20 to describe circles but the disks themselves will not revolve as they are prevented from doing so by the respective arms 14 and 27. The plates however will move up and down and back and forth sidewise. The peculiar motion imparted to the plates produces a continuous rolling and shifting of the ball, whereby the point of contact between the ball and the disk is constantly changed and all portions of the ball are exposed or brought into position to receive an equal quantity of the covering material. Revolving the shaft 2 also revolves the sleeve 29 through the operative connection of the pulleys and belt and therefore the arms 33 and 34 are revolved around the ball carrying the receptacles and the material thereon. The coating of rubber or cement on the thread prevents the same from slipping down off of the ball and greatly assists in the even distribution of the thread over the surface of the ball.

It will be readily seen that the construction of my machine can be modified without departing from the spirit of the invention as for instance the shaft 3 together with the head 7 and the bolt 11 and the shaft 15 together with the head 19 and the bolt 22 simply form cranks and any form of a crank can be substituted therefor.

What I claim is:—

1. A machine for forming balls, comprising a frame, a driving shaft mounted in said frame, short shafts mounted at opposite sides of said frame, means operatively connecting said driving shaft with said short shafts, a head rigidly secured on the inner end of each of said short shafts, a disk rotatably secured eccentrically on each of said heads, each of said disks having a slideway extending from the perimeter towards the center thereof and pins journaled at opposite sides of said frame, each of said pins having an arm extending into the slideway in the disk adjacent thereto.
2. A machine for forming balls, comprising a frame, a driving shaft mounted in the upper part of said frame, shafts mounted on each side of said frame below said driving shaft, means operatively connecting said driving shaft with said last-mentioned shafts, a head mounted on the inner end of each of said last-mentioned shafts, a disk secured eccentrically on each of said heads by means of a bolt which passes through the center of the disk, said disks having radial slideways, pins journaled at opposite sides of said frame, each of said pins having an arm extending into the slideway in the adjacent disk, a sleeve arranged around one of said last-mentioned shafts, arms secured to said sleeve, a thread receptacle secured to each of said arms and means for operatively connecting said sleeve with the driving shaft, for the purpose set forth.
3. A machine for forming balls, comprising a frame, a driving shaft mounted in said frame, short shafts mounted at each side of said frame, means operatively connecting said driving shaft with said short shafts, a head mounted on the inner end of each of said last-mentioned shafts, a disk secured eccentrically on each of said heads by means of a bolt which passes through the center of the disk, each of said disks having a radial slideway, pins journaled at opposite sides of said frame, each of said pins having an arm extending into the slideway in the adjacent disk and a receptacle for holding the material for forming the balls supported so as to revolve around said disks, substantially as described and for the purpose set forth.
4. A machine for forming balls comprising a frame, a driving shaft, a short shaft mounted at one side of said frame, a sprocket wheel mounted on the outer end of said short shaft, a head arranged on the inner end of said short shaft, a spring arranged between said head and said frame, a disk eccentrically mounted on said head and having a radial slideway formed therein, a pin journaled in said frame, an arm extending from said pin into said slideway,

a bearing formed in the opposite side of said frame, a sleeve mounted in said bearing, arms secured to said sleeve, receptacles for the thread arranged on said arms, means for operatively connecting said sleeve with the driving shaft, a second sleeve arranged within said first-mentioned sleeve, means for preventing the rotation of said last-mentioned sleeve, an arm rigidly secured to said last-mentioned sleeve, a shaft arranged in said last-mentioned sleeve, a head arranged on said shaft, a disk eccentrically mounted on said head, and having a radial slideway formed therein, a pin journaled in said last-mentioned arm, and an arm extending from said pin into the slideway in said last-mentioned disk, all arranged substantially as described and for the purpose set forth.

5. In a machine for forming balls, a frame, two plates mounted in said frame and arranged to engage the core of the ball between their adjacent faces, means for causing the centers of the said plates to move in a circular path and means for preventing the rotation of the said plates without interfering with the movement of the centers of the said plates.

6. In a machine for forming balls, a frame, two plates mounted in said frame and arranged to engage the core of the ball between their adjacent faces, means for causing the centers of said plates to move in a circular path, means for preventing the rotation of said plates without interfering with the movement of the centers of the said plates and means for revolving the material which is to form the ball around the core of the ball.

7. In a machine for forming balls, a frame, two plates mounted in said frame and arranged to engage the core of the ball between their adjacent faces, means for causing the centers of said plates to move in a circular path and two arms mounted so as to rock in said frame and each of said arms being arranged to engage with one of said plates so as to prevent the rotation thereof without interfering with the movement of the center of said plate.

8. In a machine for forming balls, a frame, a crank having one end rotatably mounted in said frame, a disk rotatably mounted on the other end of said crank, means for turning said crank and means for preventing the rotation of said disk.

9. A machine for forming balls comprising a frame, cranks journaled at opposite sides of said frame, a disk centrally mounted on the inner end of each of said cranks, means for turning said cranks and means for preventing the rotation of said disks.

10. The combination in a machine of the class described, of a pair of oppositely disposed circulatory members, means for imparting to said members movements which differ in phase with respect to one another, means to cause said members to sustain a core between them and means for winding a cord or thread about said core.

11. The combination in a machine of the class described, of a pair of oppositely disposed members, means to impart to each a circulatory movement about a constantly moving center, means to cause said members to hold a core between them, and means to wind a cord or thread about said core.

12. A machine of the class described, consisting of oppositely disposed elements, means to cause the phase of movement of one element to constantly differ with respect to the phase of movement of the other element by approximately 180 degrees, means to cause said elements to sustain a core between them, and means to wind a cord or thread about said core.

13. A machine of the class described, involving a pair of oppositely disposed circulatory members, means to cause the phase of the movement of one member to maintain a constant difference of relation to the phase of the movement of the other member, means to cause said members to hold a core between them, and means for winding a cord or thread about said core.

14. A machine of the character described, involving a cord winding mechanism and means for rotating a core about a constantly changing axis during the operation of said winding mechanism and the winding of the cord on said core.

15. A machine of the character described, involving a cord winding mechanism, oppositely disposed circulatory elements, means for imparting to each a definite circular



movement, which has a constant difference of phase with respect to the movement of the other element and means to cause said elements to hold a core between them during the winding of a cord thereon.

5 16. A machine of the character described, consisting of means to rotate a core about a constantly changing axis involving two circulatory members oppositely disposed to one another, means to cause the movement of each member during its circulatory motion to differ in phase with  
10 respect to the movement of the other member, means to cause said members to hold said core between them, and means for winding thereon a cord or thread.

17. The combination in a machine of the class designated, of a pair of oppositely disposed, alternately, circu-

latory plates, means for imparting motion thereto and for 15 causing the rotation of an object held between them, a frame to revolve about said plates having supplies of cord or thread mounted thereon, needles on said frame to direct the passage of said cord to said object, and means to regulate the tension of said cord. 20

In testimony whereof, I sign the foregoing specification, in the presence of two witnesses, this eleventh day of March 1903. at Cleveland, Ohio.

HARRY C. CLIPPINGER.

Witnesses:

VICTOR C. LYNCH,  
GERTRUDE M. HAYES.