F. R. WHITE.

CLUTCH MECHANISM FOR BUTTON ATTACHING MACHINES.

APPLICATION FILED JAN. 26, 1915.

1,256,755.

Patented Feb. 19, 1918.

Fig. 1.

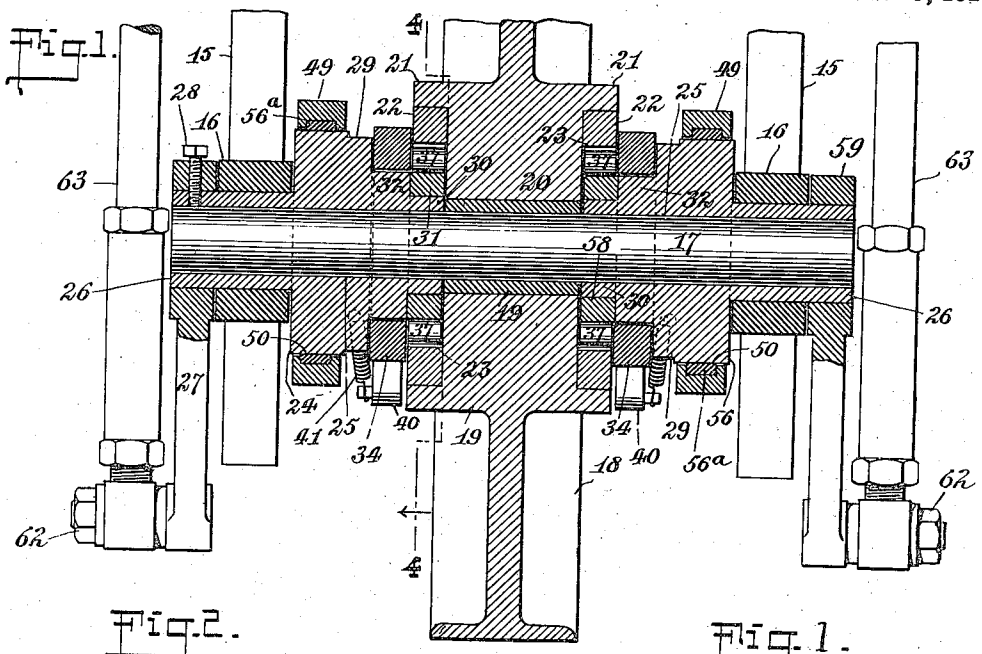


Fig. 2.

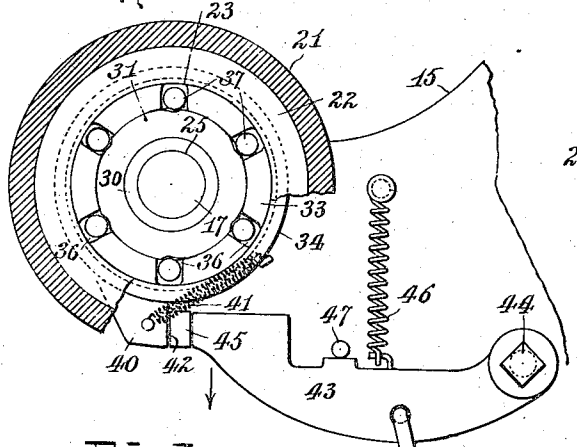


Fig. 1.

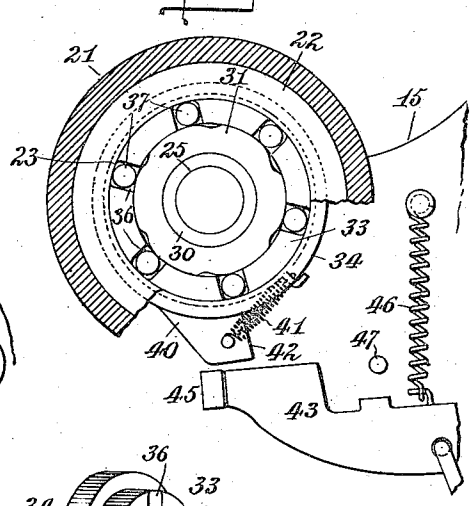


Fig. 3.

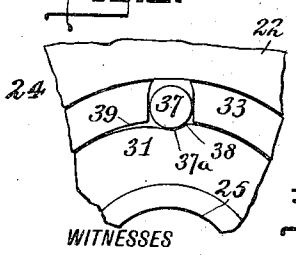


Fig. 4.

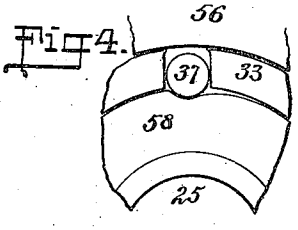
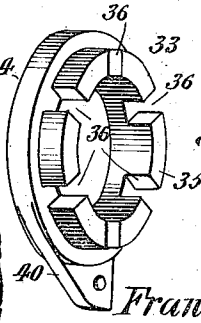


Fig. 2.



WITNESSES

John Cook.

George E. Cook.

INVENTOR

Franklin R. White.

BY George Cook

ATTORNEY

UNITED STATES PATENT OFFICE.

FRANKLIN R. WHITE, OF WATERBURY, CONNECTICUT, ASSIGNOR TO PATENT BUTTON COMPANY, OF WATERBURY, CONNECTICUT, A CORPORATION OF CONNECTICUT.

CLUTCH MECHANISM FOR BUTTON-ATTACHING MACHINES.

1,256,755. Specification of Letters Patent. Patented Feb. 19, 1918.

Application filed January 26, 1915. Serial No. 4,453.

To all whom it may concern:

Be it known that I, FRANKLIN R. WHITE, a citizen of the United States, and a resident of Waterbury, in the county of New Haven and State of Connecticut, have made and invented certain new and useful Improvements in Clutch Mechanism for Button-Attaching Machines, of which the following is a specification.

This invention relates to a clutch mechanism for button attaching machines, the object being to provide a clutch mechanism which is of simple and compact nature and therefore especially adapted for that type of machine which includes two separate and complete apparatus for securing buttons mounted on a single stand and spaced a slight distance apart so as to be easily and readily accessible by a single operator.

A further object is to provide a clutch or driving mechanism for button attaching machines wherein a single balance wheel is used for two button attaching machines, the clutch being so arranged and designed as to separately engage both sides of the belt driven balance wheel and actuate either of the said button attaching machines.

A further object is to provide a double roller clutch mechanism wherein the said clutches are formed as right and left handed ones and adapted to engage the respective sides of a single balance wheel, thus allowing a single balance wheel to perform its functions in connection with either of two complete button attaching machines which are mounted upon a single stand and so spaced as to be easily accessible by a single operator who is seated in front of the stand.

In the design of a button attaching machine it is to be noted that two different but standard sizes of buttons are ordinarily used upon a single garment, and it is essential that the machines for attaching the buttons be mounted upon a single stand, and spaced a slight distance apart so as to be readily accessible by a single operator, and furthermore that the control of the machine be by means of pedals spaced a slight distance apart so as to be conveniently operated by the two feet of an operator. With this in view, the clutch mechanism herein disclosed has been designed and contains certain novel advantages and functions when arranged in such relation and when acting in such capacity. Such and other advantages and objects will appear as the description proceeds, wherein it is to be understood that changes in the precise embodiment of the invention can be made within the scope of what is claimed, without departing from the spirit of the invention.

The preferred embodiment of my invention is disclosed in the accompanying drawings, wherein:—

Figure 1 is a view in longitudinal section of my improved button machine driving mechanism or clutch;

Fig. 2 is a fragmental view in section, taken on the line 4—4 of Fig. 1;

Fig. 3 is a similar view showing the arrangement of parts after the pedal has been depressed and the clutch is in engagement;

Fig. 4 is a view in perspective of the roller cage of the clutch;

Fig. 5 is an enlarged view illustrating the depressions within the driven member of the left hand clutch and into which the rollers are adapted to seat as the clutch is moved to its inoperative position;

Fig. 6 is a view similar to Fig. 5 illustrating the right hand clutch member.

Referring specifically to the several views, wherein similar reference numerals designate corresponding parts throughout, the clutch mechanism herein disclosed, although capable of various usage is particularly applicable to automatic button attaching machines and for this reason is, in the present drawings, illustrated as being operatively connected with and adapted to impart intermittent reciprocatory movement to two connecting rods 63, the upper ends of which are operatively connected with two separate and independent button attaching machines; the clutch mechanism being controlled by means of two treadles or equivalent foot-operated members acting through suitable rods and controlling members or triggers (one only of which rods and triggers, however, is shown, at 61 and 43 in the drawings), to control the clutch mechanism and secure the operation of the button attaching machines, by power transmitted from the main driven or balance wheel 18 through the clutch mechanism and the connecting rods 63 to the said attaching machines.

Projecting from a supporting stand whereby the button attaching machines are supported are the spaced brackets 15—15, which are provided, adjacent their outer extremi-

ties with the bearings 16—16. A shaft 17 extends through and beyond the said bearings and although not in direct contact therewith, is rotatably supported thereby. A balance wheel 18 is rotatably mounted upon the shaft 17, and has its hub 19 provided with a bushing 20 so as to secure the smooth and substantially frictionless rotation thereof. The hub of the balance wheel is provided with oppositely and outwardly extending rims 21—21 against which rest the wearing rings 22—22, the same being formed of some hard and highly polished metal, whose inner surfaces 23—23 constitute the rotating portions of the clutch mechanism. Extending between one of the bearings 16 and the adjacent face of the wheel hub is the clutch member 24 which is provided with the central opening 25, receiving the shaft 17 therethrough. The clutch member 24 is provided with the cylindrical bearing portion 26 which extends through and is supported by the bearing 16, beyond which it extends and upon the protruding portion of which is mounted the crank arm 27. The crank arm may be formed integral with the cylindrical bearing portion 26 of the clutch member, should it be so desired, due provision being made for the assemblage of the various parts by reason of the bearing 16. A set screw 28 projects through the crank arm and bearing portion of the clutch member 24 and engages the shaft 17 so as to hold the same against shifting, the clutch member 24 being also held against shifting by the crank arm 27 and the enlarged portion 29 of the clutch member, the same being arranged upon opposite sides of the bearing 16 and accordingly held thereby.

The inner extremity of the clutch member 24 is reduced as at 30 and is preferably provided with the wearing ring 31 formed of some hard and suitable metal and is positioned within and concentric of the wearing ring 22 with which it co-acts, as presently described. The clutch member 24 is provided with the reduced intermediate portion 32 upon which is rotatably mounted a roller cage or guide 33. This roller cage or guide is formed with the annular ring 34 resting upon the reduced intermediate portion 32 of the clutch member and bearing against a vertical ledge thereof. The ring 34 is held against shifting in the opposite direction by reason of its contact with the wearing ring 22 of the balance wheel hub. The ring 34 is provided with the axially extending annular flange 35, of such thickness and diameter as to fit between the inner surface of the hub opening as defined by the inner surface of the wearing ring 22 and the outer surface of the clutch member 24, the latter being preferably provided with the wearing ring 31, although it is to be noted in this connection that the wearing rings 22—31 may be omitted, provided the hub of the balance wheel and the clutch member 24 be formed of some metal adapted to withstand the friction and wedging action to which it is necessarily exposed. The annular flange 35 is provided at definite intervals with the slots 36, adapted to receive the rollers 37 therein, the same being slightly larger in diameter than the spacing between the inner and outer surfaces of the concentric wearing rings 22—31 and normally received within suitable depressions 37^a formed in the wearing ring 31. Each of these depressions 37^a is provided with the abruptly terminating end 38 and the gradually merging or sloping end 39, the sloping face 39 being in back of the abruptly terminating face 38 considered with respect to the anti-clockwise direction of rotation of the balance wheel and clutch member as shown in Fig. 5 of the drawings.

The roller clutch as thus constituted is adapted to forcibly drive the clutch member 24 and crank arm 27 from the balance wheel when the rollers are wedgedly forced between the slanting faces 39 of the depressions and the inner surface of the wearing ring 22. In order to control the position of the rollers and therefore provide for the engagement and disengagement of the clutch mechanism, the roller cage or guide is provided with the peripheral lug 40 to which a tension spring 41 is secured, the remote end being secured to an intermediate peripheral portion of the clutch member 24. The spring is thus adapted to normally hold the roller guide or cage in such position that the varicus rollers will be seated within the depressions 37^a and therefore out of wedged contact with the balance wheel and clutch member 24, allowing for the free rotation of the balance wheel as will be readily appreciated. The lug 40 which projects from the outer surface of the roller cage is provided with the radial surface of ledge 42 which co-acts with a releasing lever or trigger 43, the latter being pivoted at its remote end by the pin or bolt 44 and having its opposite end somewhat enlarged as at 45 and arranged in the path of motion of the radial face 42 of the lug. A tension spring 46 is secured to the bracket 15 and engages the trigger 43 so as to hold the same with the free end 45 in the path of motion of the lug or stop 40 of the roller cage. A pin 47, projecting from the side of the bracket 15, prevents the end 45 of the trigger from contacting with the surface of the roller cage and thus prevents any wear therebetween.

As the trigger or releasing lever 43 is moved downward as indicated by the arrow in Fig. 2, the spring 41, which is under tension, immediately advances the roller cage with respect to the clutch member 24, so that the rollers will be shifted with respect there-

to and moved out of the depression 37ª and into wedged engagement with the inner surface of the wearing ring 22 and against the inclined faces 39 of the depression, resulting in the wedged engagement, and transmission of power, between the balance wheel, the rollers and the clutch member. The clutch member 24 will therefore be rotated by the balance wheel, resulting in the corresponding rotation of the crank arm 27 and the actuation of parts connected thereto. The crank arm will continue to rotate until such time as the trigger 43 is allowed to return to its normal position by the action of the spring 47, at which time, the end 45 will again return in the path of motion of the stop 40 upon the roller cage, which coming into contact therewith, forcibly moves the rollers out of wedged engagement between the wearing rings, allowing them to drop into a seated position within the depressions 37ª, the momentum of the clutch member being sufficient to return the rollers to such position, while the rollers are prevented from coming into wedged engagement with the opposite abrupt faces 38 of the depressions in the wearing ring 31, by reason of the direction of rotation of the ring 22, as will be readily apparent.

In order to prevent the excessive oscillation of the clutch member 24, after it has been freed from the balance wheel by the depositing of the rollers within the depression, a friction brake 49 is provided and encompasses the enlarged portion 29 of the clutch member, the same being provided with the brake engageable surface 50 therefor, as is usual in clutch mechanisms and the details of which brake need not be herein further illustrated or described.

A second clutch member 56, provided with an opening 57 extending therethrough, is mounted upon the shaft 17 and extending between the remote side of the balance wheel hub and the adjacent bearing 16. This clutch member is substantially identical with the clutch member 24 previously described, with the exception however, that the wearing ring 58, which is mounted upon or formed as a part of the front extremity thereof, has the depressions formed therein in a manner opposite to that of the ring 31, thus forming right and left hand clutch members adapted to engage opposite sides of the balance wheel hub and transmit motion therefrom to the crank arms 27 and 59. In this connection it is to be understood that the crank arm 59 is fixedly secured to or formed as a part of the clutch member 56 but does not engage the shaft 17, as it is mounted for rotation with respect thereto, so that the engaging of one clutch does not necessarily cause the actuation of both button machines.

From the foregoing it will be apparent that, although the clutch mechanism may be used in other relations, it is particularly adapted to, and of especial advantage in connection with, a button attaching mechanism comprising two machines arranged side by side whereby buttons of two different sizes may be quickly secured to a garment and by an operator without necessitating his change of position. The balance wheel 18, is provided with an outer surface adapted to receive a driving belt therearound for the transmission of power to, and actuation of, either of the button machines.

Having thus described my invention, what I claim is:—

A clutch mechanism of the class described comprising a shaft, a wheel mounted for free rotation thereon held against shifting and provided with a cylindrical recess extending within the hub thereof, an annular wearing ring with a smooth cylindrical inner surface disposed within said hub recess, a clutch member mounted for free rotation upon said shaft provided with a reduced cylindrical end projecting within said hub recess and contacting with the inner wall thereof, a wearing ring with external depressions fixedly mounted upon the reduced extremity of said clutch member, rollers contained between said wearing rings and normally located within said depressions, said clutch member provided with an intermediate reduced cylindrical portion defining a ledge between the same and the main body of the clutch member, a roller cage rotatably mounted upon said intermediate reduced portion held against shifting by the above-mentioned ledge and by contacting with the said wearing ring of the wheel hub, portions of said roller cage projecting between the wearing rings of the said hub and the said clutch member and engaging said rollers adapted to shift the positions thereof, and resilient means adapted to shift the position of said roller cage with relation to said clutch member and to assist in the stopping of the said roller cage and clutch member.

Signed at Waterbury, in the county of New Haven and State of Connecticut, this 19th day of January, A. D. 1915.

FRANKLIN R. WHITE.

Witnesses:
JULIA A. CREEM,
KATHARINE A. RUBEY.