

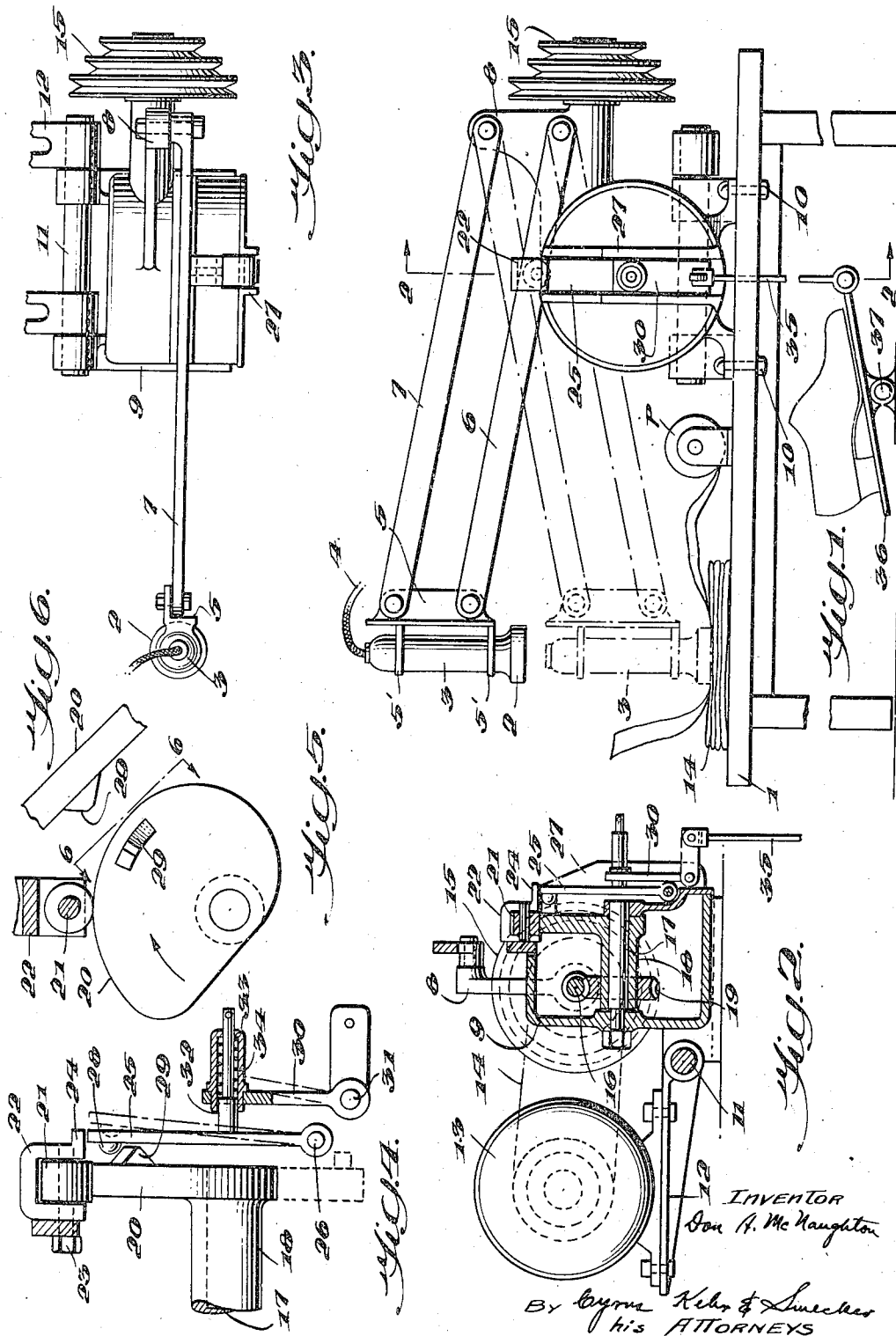
March 22, 1949.

D. A. McNAUGHTON

2,465,028

TRANSFER DEVICE

Filed Jan. 19, 1944



UNITED STATES PATENT OFFICE

2,465,028

TRANSFER DEVICE

Don A. McNaughton, Knoxville, Tenn.

Application January 19, 1944, Serial No. 518,861

7 Claims. (Cl. 41-1)

1

This invention relates to an improvement in transfer devices of the character used for providing knitted fabrics, such as hosiery, with marks of identification or other information.

In marking knitted fabrics, particularly articles of wearing apparel, such as hosiery, with marks that represent trade-marks, thread and gage number, etc., it has been the practice heretofore to utilize so-called "transfer" paper, which is placed with its printed side against the fabric and pressed thereon by a heated stamp or a transfer head which is applied to the opposite side of the paper. This causes a transfer of the impression from the paper to the fabric.

This transfer paper is supplied to the mill in the form of a roll, and is used by the operator by unwinding the roll gradually over the goods with one hand while the transfer head including the heated plate or stamp is impressed thereon with the other hand. This operation has been performed usually by hand and it requires both hands of the operator to handle the paper and the stamping head. One or the other must be released each time that an impression is made, so that the operator may remove the stamped article. This makes the operation very slow and time-consuming, and the manipulation of the transfer head by hand becomes very tiring, resulting in fatigue of the operator.

It has been proposed heretofore to operate the transfer head mechanically, as by a foot pedal, or even by power, such as fluid pressure, but the manual actuation thereof is also tiring and difficult to produce the required pressure, while the power devices proposed for this purpose have been extremely complex and expensive to produce and are difficult to control to meet the requirements for this purpose.

The object of this invention is to improve the construction of such transfer device to provide for power operation thereof so that the transfer head will be raised and lowered by power means, and capable of control so as to maintain this head in continuous operation, provision being made also for the automatic disconnection of the head from the power means, after a cycle of movement of the head, unless the automatic means is released which would then permit the continued operation of the transfer head for a period of time, such as may be desired by the operator. Thus the operator may start the machine in operation and it will continue to function, so long as desired by the operator, such for instance as the period required for applying identifying marks on a pile of socks. Then upon

2

release of the holding means under the control of the operator, the transfer head will be stopped automatically at the top of its stroke until the operator is ready to resume the stamping operation.

This is accomplished in the preferred embodiment of the invention by means of a cam acting against the supporting arms for the transfer head, the rotation of which cam would cause vertical reciprocating movement of the transfer head. A latch is arranged adjacent the cam in position to be engaged by the supporting arm to hold said arm and the transfer head in elevated position so long as the latch remains in its supporting position. Provision is made for normally tending to maintain the latch in its supporting position until it is released by the operator, when the cam would continue to function to raise and lower the transfer head, applying impressions to the hosiery or other articles on each stroke.

This preferred embodiment of the invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a side elevation of the transfer machine;

Fig. 2 is a vertical sectional view therethrough on the line 2-2 of Fig. 1;

Fig. 3 is a top plan view of the machine;

Fig. 4 is an enlarged cross section, partly in elevation, through the cam controlling means;

Fig. 5 is a side elevation of the cam, with a follower portion in section; and

Fig. 6 is an edge view of the cam on the line 6-6 of Fig. 5.

The invention is shown as adapted for use on a table 1 on which may be placed a pile of hosiery H adapted to be marked successively by means of this transfer device. A roll of transfer paper P is adapted to be mounted on the table 1 adjacent the pile of hosiery, so that the tape forming the transfer paper on the roll may be drawn out by the operator over the pile of hosiery, as shown in Fig. 1.

The invention utilizes a transfer head that comprises an impression plate or stamp 2 and a heater 3, preferably of the electrical type, shown as having an electric cable 4 connected therewith, adapted to extend to a suitable source of electrical supply.

The transfer head is adapted to be supported on a holder 5 having rings 5' embracing the heater element 3 and securing the head to the holder 5. The holder 5 is mounted on a pair of parallel links 6 and 7, each of which is pivoted at one end to the holder 5, while the opposite end thereof is

3

pivoted to a supporting frame 8 in vertically spaced relation. Thus the links 6 and 7 are maintained in parallel relation and are capable of vertical swinging movement to reciprocate the transfer head between the full line position and the dotted line position indicated in Fig. 1.

The upright support 3 to which the links 6 and 7 are pivoted, is a part of a housing structure designated generally at 9, which is seated upon the table 1, and may be secured thereto by means of screws 10.

Also secured to the housing 9 by means of a mounting rod 11, are supported brackets 12 upon which an electric motor 13 (Fig. 2) is mounted. The motor 13 is adapted to operate the transfer device, and has a belt 14 extending therefrom to a pulley 15 mounted on a drive shaft 16 that is journaled in the housing 9.

Also mounted in the housing 9 and extending transversely thereof with respect to the drive shaft 16 is a fixed shaft 17 upon which is journaled a sleeve 18 carrying a gear 19, meshing with a worm that is secured to the drive shaft 16, thus forming a geared connection from the drive shaft 16 to the sleeve 18. A cam 20 is fixed on the sleeve 18 to rotate therewith, and is shaped vertically substantially as shown in Fig. 5, to impart the desired motion to the transfer head. The periphery of the cam 20 has a follower roller 21 bearing thereon and journaled within a bracket 22 secured at 23 to one side of the link 6.

Thus upon rotation of the cam 20 in the direction indicated by the arrow in Fig. 5, the follower roller 21 will follow the contour of the cam, and at the proper time will allow the links 6 and 7 to be dropped from the position shown in full lines to the position shown in dotted lines in Fig. 1, and to hold the transfer head pressed against the paper tape on the fabric a sufficient interval to transfer the impression from the paper to the fabric. Then the continued rotation of the cam 20 would cause a lifting movement of the transfer head by swinging the arms 6 and 7 upwardly to the full line position in Fig. 1.

Provision is made for controlling these movements under the control of the operator. The bracket 22 has an outward projection 24 extending in position to engage a latch 25 pivotally mounted at 26 between a pair of opposed flanges 27 on the housing 9. The latch 25 is of a length, such that it is spaced from the projection 24 when the follower roller 21 is in its uppermost position as shown in Fig. 4. The latch 25 has a knob 28 on the inner side thereof in position to engage a cam projection 29 on the face of the cam 20. This cam projection is so arranged that it will have a tendency to engage the latch 25 and push it to one side when the cam completes its cycle of operation and has raised the transfer head to its elevated position. If the latch 25 can be thus moved out of the path of the projection or remains in such displaced position, as indicated in dotted lines in Fig. 4, the continued rotation of the cam will cause the transfer head to be lowered again for another impression, and this will continue so long as the latch 25 remains in this position.

Provision is made for normally tending to urge the latch to its full line position, for which purpose, I have provided a bell-crank lever 30 pivoted at 31 in front of the latch 25, between the flanges 27. One arm of the bell-crank lever 30 carries a plunger 32 slidably mounted in a sleeve 33 and spring-pressed by means of a coiled spring 34 to cause the plunger 32 to bear resiliently against

4

a side of the latch 25 when the lever 30 is in full line position shown in Fig. 4.

The lever 30 is capable of swinging out of such position, and its other arm is connected through a tie rod 35 with one end of a foot treadle 36 which is pivotally mounted at 37 on the floor within convenient reach of the operator. The treadle 36 is of a character such that it may be depressed by the operator to swing the bell-crank lever 30 away from the latch 25 and thus withdraw the pressure of the plunger 32 from the latch; otherwise it would allow the plunger to hold the latch in its full line position where it would stop the transfer head elevated. When the foot treadle 36 is not depressed, the spring-pressed plunger 32 will allow the latch 25 to move aside during the passage of the cam projection 29 but this is only momentary and the latch would be returned immediately to its full line position in Fig. 4, before the transfer head would start downward. Thus the latch would hold the head elevated while allowing the continued rotation of the cam 20. On the other hand, when the foot treadle 26 is depressed, withdrawing the spring-pressed plunger from bearing relation against the latch, the side cam projection 29 will cause the latch to be pushed out of the path of the follower projection 24, and it will remain in this position until the treadle is released. Then the transfer head would be moved up and down for each cycle of rotation of the cam 20, until the foot treadle is released.

Ordinarily the operator would place a stack of a dozen pieces on the table 1, and after becoming experienced in the use of the device, she could manipulate the strip of transfer tape in one hand while removing the stamped article with the other, and thus allow the continued operation of the machine, successively applying the stamped impression to the articles in a continuous manner. After the transfer head has started its upward stroke, the operator would remove the stamped article with one hand, while drawing outward another impression on the tape with the other to a proper position over the next succeeding article, ready for the next stroke of the device. The heated unit or plate 2 remains in pressure contact with the tape a sufficient interval to transfer the impression to the article and then is raised to its uppermost position again by the cam 20.

If the operator fails to turn an article properly, or for any other reason desires to stop the operation, it is merely necessary to release the treadle 36 which will then cause the spring-pressed plunger 32 to restore the latch 25 automatically to its latching position. Then when the impression head is raised to its uppermost position, it will be held there by the latch 25.

In normal operation the entire attention of the operator may be given to the manipulation of the articles and tape, allowing the machine to operate the transfer head in successive strokes, or at intervals as desired by the operator. This relieves the operator of much of the work and fatigue of this operation, and insures much greater speed in an emergency in applying the impressions to the respective articles.

I claim:

1. In a transfer device, the combination of a transfer head, a pair of pivoted parallel arms supporting said head for upward swinging movement, one of said arms having a follower thereon with an outward projection, power means including a rotatable cam bearing against said follower to raise and lower the head, a pivoted latch in

5

position to engage said projection to hold the head in an elevated position, and a side projection on the cam arranged to displace the latch from said holding position.

2. In a transfer device, the combination of a transfer head, a pair of pivoted parallel arms supporting said head for upward swinging movement, one of said arms having a follower thereon with an outward projection, power means including a rotatable cam bearing against said follower to raise and lower the head, a pivoted latch in position to engage said projection to hold the head in an elevated position, a side projection on the cam arranged to displace the latch from said holding position, a lever adjacent said latch, a spring-pressed plunger carried by the lever in position to bear against the latch, and means connected with the lever for moving the plunger out of bearing relation with the latch.

3. In a transfer device, power stop control mechanism comprising power means including a rotatable cam, follower means arranged in operative relation with the cam and adapted to be raised and lowered thereby periodically, a latch arranged for holding the follower means against movement by the cam, resilient means bearing against the latch tending to maintain the latch in said holding position, means for automatically moving the latch from said holding position, and means for moving said resilient means out of bearing relation with the latch.

4. In a transfer device, power stop control mechanism comprising power means including a cam, a follower bearing upon the cam in position to be actuated thereby, a pivoted latch having a portion thereof in position to support the follower in an elevated position, a lever beside the latch, a spring-pressed plunger carried by the lever in position to bear against the latch, and means for moving the lever to move the plunger away from the latch.

5. In a transfer device, the combination of a transfer head, a pivoted arm supporting said head for swinging movement, power means including a rotatable cam adapted to bear against said arm to raise and lower the transfer head, and power stop control means coacting with the pivoted arm, said power stop control means comprising a latch arranged for holding the arm against move-

6

ment by the cam, resilient means bearing against the latch tending to maintain the latch in a holding position, means for moving the latch from said holding position, and means for moving said resilient means out of bearing relation with the latch.

6. In a transfer device, the combination of a transfer head, a pair of pivoted parallel arms supporting said head for swinging movement, a follower carried by one of said arms, power means including a rotatable cam coacting with said follower whereby the arms are lowered and raised, and power stop control means coacting with the cam and the follower, said power stop control means comprising a pivoted latch coacting with the cam and the follower and arranged for holding the arms against movement by the cam, resilient means bearing against the latch tending to maintain the latch in a holding position, means carried by said cam for moving the latch from said holding position, and manually actuated means for moving said resilient means out of bearing relation with the latch.

7. In a transfer device, power stop control mechanism comprising power means including a cam, a follower bearing upon the cam in position to be actuated thereby, a pivoted latch in position to support the follower in an elevated position, a lever beside the latch, a plunger carried by the lever in position to bear against the latch, and manually actuated means for moving the lever and plunger away from the latch to permit operation of the transfer device.

DON A. McNAUGHTON.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,009,353	Thomas	Nov. 21, 1911
1,066,653	Rau	July 8, 1913
1,639,428	Daly	Aug. 16, 1927
1,846,179	Biggert	Feb. 23, 1932
2,177,615	Autem	Oct. 24, 1939
2,301,556	Maris	Nov. 10, 1942
2,356,951	Runton	Aug. 29, 1944