Aug. 23, 1938. G. HORN ET AL 2,127,772

TAPING MACHINE

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Fig. 2

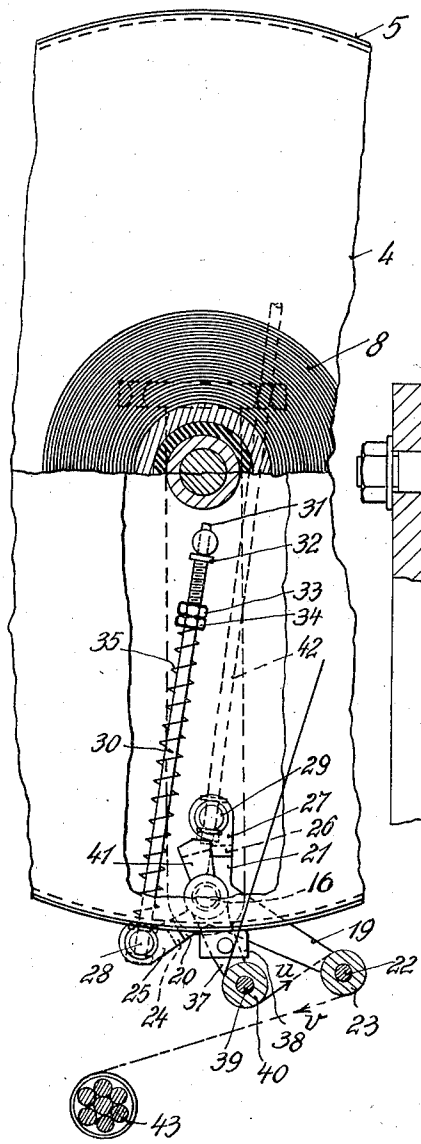
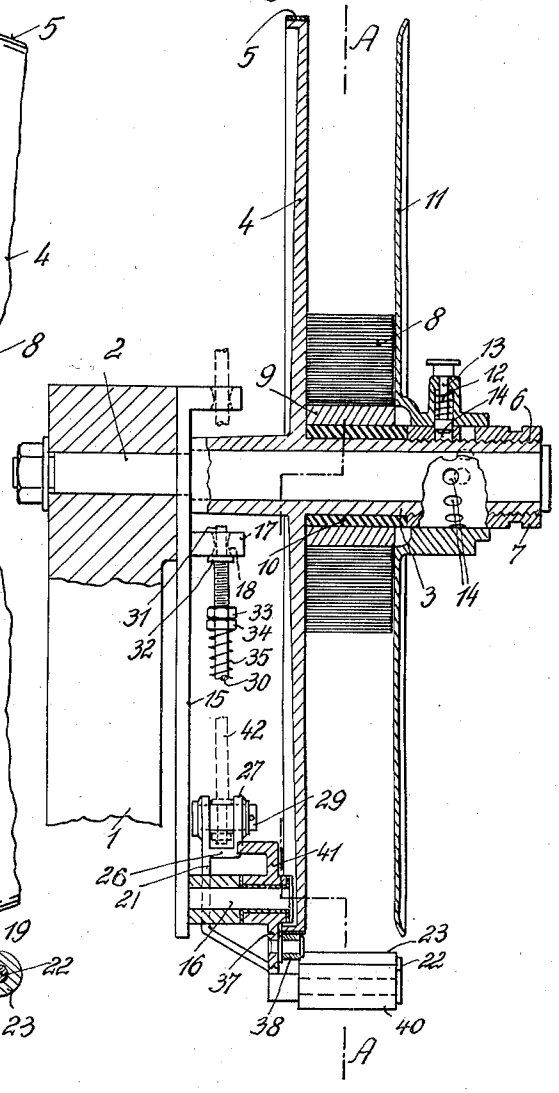


Fig. 1



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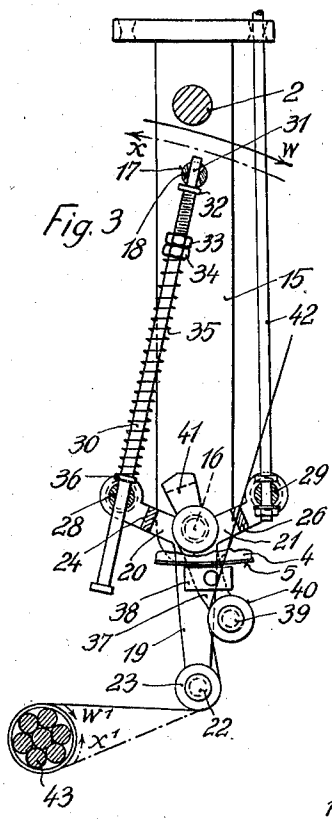

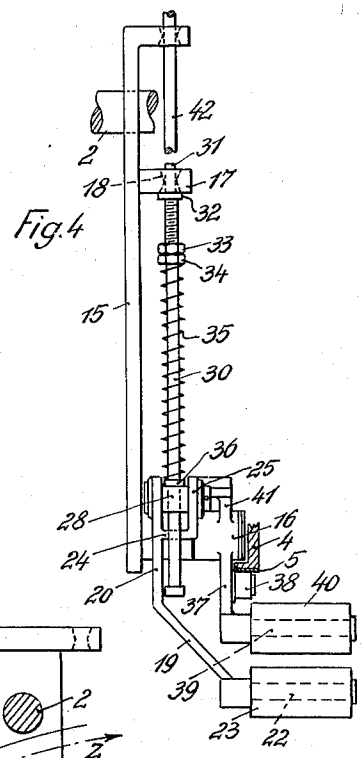

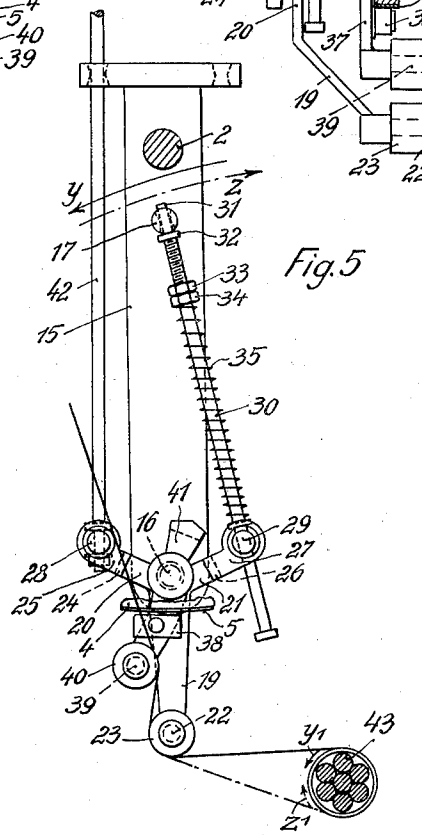

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2,127,772

TAPING MACHINE

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Application August 12, 1937, Serial No. 158,792
In Germany November 27, 1935

3 Claims. (Cl. 242—75)

The present invention relates to taping machines provided with rolls of tape which are used in a great number of cable machines of all kinds for covering the cable with paper, rubber and the like and also in other machines.

Hitherto lateral pressure is exerted upon tapes unrolling from rolls of tape to effect stretching or tensioning of the unrolling tapes. Due to the continual alteration of the diameter of the roll of tape, the latter cannot permanently be tensioned uniformly. Moreover, on each change of the roll of tape the tension is to be adjusted according to feeling.

To obtain a permanently uniform tension it has already been proposed to pass the tapes around tension levers arranged outside the roll of tape which levers in turn influence the braking of the unrolling spool. These devices required a construction of greater height, that is to say more space for mounting them, and caused a reduction of the speed of operation by their weight and their greater distance from the revolving axis or the core of the cable respectively.

The object of the present invention is to obtain a braking of the roll of tape in dependence on a predetermined braking tension which braking is equally powerful from the beginning to the end independent of the diameter of the roll of tape completely and the skill and the feeling of the operator and remains equaly powerful even after a change of the roll of tape. Besides, this brake device, due to its low height of construction and its arrangement in close proximity to the revolving axis, permits the highest speed of operation.

Now, the solution of this problem is based upon the fact, that the unrolling tape is passed over a brake lever for braking the entire spool, i. e. the carrier for the roll of tape with the roll of tape, and over a tension lever.

The brake lever and the tension lever are mounted inside the circumference of the brakable disc of the carrier for the roll of tape and journalled directly beside the latter in a supporting member. The levers together with the guide rollers mounted at their ends swing into a position close to the periphery of the brake disc of the carrier for the roll of tape. The guide rollers for the tape only extend beyond the periphery of the carrier for the roll of tape and the entire taping machine may be brought in close proximity to the covering station. By the symmetrical arrangement of the individual parts and the determination of the tensioning or stretching action by means of an adjustable, exchangeable tension spring the taping machine may be adjusted at will for effecting a right hand or a left hand covering.

A substantial improvement of the braking device of the rolls of tape in cable machines and of all unrolling rolls of tape which require braking and tensioning or stretching respectively of the unrolling tape, for instance also rolls of rubber tape in longitudinal rubber covering machines, is obtained with the subject matter of the invention. The tensioning or stretching of the tape always remains the same independent on the feeling of the operator and does not require an adjustment after a change of the rolls of tape. The change of the rolls of tape may be effected very quickly as the guidance of the tape over a number of pins is not necessary which hitherto rendered this change difficult. The thread tension device, moreover, simultaneously also serves as stop motion or disconnecting means at the end of the unrolling of the tape. The same device also may eventually be used to stop the machine. The fixing of the rolls of tape upon the carrier is reliable and simple. Due to the arrangement of the braking device in close proximity to the covering station, the speed of operation of the machine may be increased. The output of machines provided with the new taping machine, moreover, is increased due to the quicker change of the rolls of tape and the fact that no re-examination whatever of the tape tension by feeling is required.

In the accompanying drawings one construction of a taping machine according to the invention is shown by way of example.

In these drawings:

Fig. 1 shows a longitudinal section through a taping machine with the rollers in the position of rest,

Fig. 2 is a broken away section on line A—A of Fig. 1,

Fig. 3 is a detail view showing the rollers in the operative position,

Fig. 4 is a side view of the device shown in Fig. 3 and

Fig. 5 is a detail view corresponding to Fig. 3 showing reversed draw off of the tape.

Pivotally arranged on a shaft 2, mounted in the usual manner in a support 1, is a member carrying the roll of tape which is provided with a hub 3 and a disc 4. The disc 4 is provided with a brake surface 5 on its periphery. The outer end of the hub 3 is provided with thread 6 on which a sleeve 7 may be screwed. The roll of tape 8 is mounted on a core 9, consisting of a wooden or metallic ring, or simply on a short sleeve of cardboard. A rubber sleeve 10 is arranged upon the

hub 3 for concentrically adjusting and fixing the core 9 on the hub 3 of the member carrying the roll of tape. The rubber sleeve 10 is somewhat longer than the core 9 and easily fits into the latter. After mounting the carrier for the roll of tape 8 provided with the core 9 upon the rubber sleeve 10, the sleeve 7 is screwed onto the hub 3 so far, that it compresses the rubber sleeve 10, until by this means a sufficiently firm seating of the core 9 with the carrier for the roll of tape 8 upon the hub 3 is obtained. Thereupon a loose disc 11 is shifted over the sleeve 7 and fixed upon same.

According to the construction shown in the drawings, a pin 13 acted upon by a spring 12 is arranged in the hub of the loose disc 11 forming part of the carrier for the roll of tape. Holes 14 are provided in the sleeve 7 a short distance from each other spirally of said sleeve 7 and into which the pin 13 may snap. Depending on the width of the roll of tape 8, the particular hole 14 is chosen for fixing the disc 11 which allows one to bring the disc 11 as close as possible to the roll of the tape 8 without exerting lateral pressure on same.

A supporting member 15, fixed to the shaft 2, carries at its free end a shaft 16 and is also provided with a projection 17 having a bore 18 enlarged at both ends. Pivotally mounted upon the shaft 16 is a tension lever which besides the arm 19 has two arms 20, 21 arranged symmetrically to each other. The free end of the downwardly directed middle arm 19 carries a laterally extending bolt 22 upon which is pivoted a guide roller 23 arranged in the plane of the roll of tape 8. The other two arms 20, 21 are inclined upwardly and provided with bores serving as bearings. At one side of the arm 20 an extension 24 is provided carrying a projection 25 arranged parallel to the arm 20. The projection 25 is provided with a bore similar to that in the arm 20. In the same manner the arm 21 is provided with a bore serving as a bearing. At one side of the arm 21 an extension 26 is provided carrying a projection 27 arranged parallel to the arm 21. The projection 27 is provided with a bore in a similar manner as the arm 21. In the bores of the arm 20 and the projection 25 a bolt 28, having a bore is pivotally journalled and in a similar manner a bolt 29 having a bore, is pivotally journalled in the bores of the arm 21 and the projection 27. A bolt 30 is inserted in the bore of the bolt 28 and this bolt 30 carries a collar 32 below the upper end 31. Screwed on a threaded portion of the bolt 30 are a nut 33 and a counter-nut 34 against which bears a compressing spring 35 surrounding the bolt 30. The other end of the spring 35 bears against a loose disc 36 which, when the bolt 30 is inserted in the bore of the bolt 28, rests upon the bolt 28. The upper end 31 of the bolt is inserted into the bore 18 of the projection 17. By the pressure of the spring 35 the tension lever 19, 20, 21 is so swung, that the arm 19 carrying the guide roller 23 occupies the position shown in Fig. 1. If the roll of tape is so inserted that the draw off is to be effected in an opposite direction, the bolt 30 is inserted in the manner described above into the bore of the bolt 29, whereby, due to the symmetrical arrangement of the two arms 20, 21, the arm 19 carrying the guide roller 23 is swung in an opposite direction (Fig. 5). By adjusting the nuts 33, 34 the tension of the spring 35 may be regulated.

Besides the tension lever 19, 20, 21 a brake lever 37 is mounted upon the shaft 16 and this lever carries a brake block 38 arranged in the range of the brake surface 5 of the disc 4. The brake lever 37 carries a bolt 39 upon which a guide roller 40 is rotatably mounted which, like the guide roller 23, lies in the plane of the roll of tape 8. Beyond its fulcrum, the lever arm 37 is provided with an extension 41, bent upwardly at an angle (Fig. 1), with which the arms 20, 21 may come into contact.

An intermediate member 42 (Fig. 3) may be inserted in the bolt 28 or 29 respectively of the free arm 20 or 21 respectively of the tension lever which member causes stopping of the machine on the end of the unrolling or on breakage of the tape. The mode of operation of this stopping device depends on the construction of the machine. For the purpose of the invention it is only of importance, that by the movement of the arm 20 or 21 respectively the intermediate member 42 inserted in the respective arm acts upon a device for stopping the machine. 43 designates the cable or the like to be covered with the tape.

The tape unrolling from the roll of tape 8 is guided first around the guide roller 40. If the tape is drawn off over the guide roller 40 it first shifts the lever 37 in the direction of the arrow *u* (Fig. 2) and presses the brake block 38 against the brake surface 5, so that the free unrolling of the tape from the roll of tape is hindered. If now the tape is passed over the guide roller 23 and is drawn off in the direction *v*, then by the increased pull the arm 19 carrying the guide roller 23 is swung against the action of the spring 35 and brought into the operative position shown in Fig. 3. Due to the tension effected by the spring 35 the arm 19 offers resistance to the draw off of the tape which resistance by a corresponding selection of the quickly exchangeable and adjustable spring may be regulated as desired.

On the movement of the resilient brake lever 37 from its braking position into a position in which braking pressure is reduced, the paper tape, due to the fact that it now only slightly surrounds the guide roller 40, does not longer exert the action upon the brake lever 37 which originally was effected in a manner like a block and tackle. The pressure of the brake block 38 decreases and finally is not longer sufficient to retain the carrier for the roll of tape with the roll of tape 8. Should the roll of tape rotate too fast and deliver too much tape, the tension lever 19 would correspondingly be pressed back by the spring 35. This would cause a greater surface of the guide roller 40 to again be covered by the tape, so that the lever 37 again would more forcibly press its braking block 38 against the braking surface 5.

The tension of the tape, therefore, exclusively is dependent on the pressure of the tension lever 19 against the tape and not dependent on the diameter of the unrolling roll of tape.

From the guide roller 23 of the tension lever 19 the tape directly runs onto the cable 43 without being guided over pins.

To obtain a faultless operation it is also necessary, that the machine be automatically stopped as soon as a tape runs off or breaks. The tension lever also renders the machine inoperative as soon as the tape does not offer resistance. This stopping of the machine may be effected mechanically or electrically.

If the direction of unrolling of the tape is

changed, the elements **30** to **35** and the element **42** are interchanged in position with respect to the arms **20** and **21**.

Fig. 3 shows the taping machine in the operative position with the bolt **30** carrying the spring **35** inserted in the arm **20**. If the taping machine is rotated in the direction of the arrow *w*, the tape is wound around the cable or the like in the direction of the arrow *w'* as shown in full lines. If, however, the taping machine is rotated in the reversed direction shown by the arrow *x*, the tape is moved around the cable in the direction of the arrow *x'* as shown in interrupted lines.

Fig. 5 shows the reversed insertion of the bolt **30** with the spring **35** in the arm **21**. If the taping machine is rotated in the direction of the arrow *y*, the tape is wound around the cable in the direction of the arrow *y'* as shown in full lines. If the taping machine is rotated in the reverse direction indicated by the arrow *z*, the tape is wound around the cable in the direction of the arrow *z'* as shown in interrupted lines.

What we claim is:

1. A taping machine having a tension device and a braking device allowing braking of the roll of tape depending upon a determined tension of the tape, comprising a shaft mounted in a stationary bearing, a carrier for the roll of tape rotatably arranged on said shaft, a brakable disc forming part of said carrier, a supporting member fixed upon said shaft, a short shaft carried by said supporting member, a brake lever pivoted on said short shaft and adapted to cooperate with said brakable disc, a guide roller carried by the free end of said brake lever, a three-armed tension lever also pivoted on said short shaft, a spring acting on one arm of said three-armed tension lever, and a guide roller carried by the free end of the middle arm of said three-armed tension lever, both of said guide rollers being arranged outside the periphery of said brakable disc in the path of the unrolling tape.

2. A taping machine having a tension device and a braking device allowing braking of the roll of tape depending upon a determined tension of the tape, comprising a shaft mounted in a stationary bearing, a carrier for the roll of tape rotatably mounted on said shaft, a brakable disc forming part of said carrier, a supporting member fixed upon said shaft, a short shaft carried by said supporting member, a brake lever pivoted on said short shaft and adapted to cooperate with said brakable disc, a guide roller carried by the free end of said brake lever, a three-armed tension lever also pivotally mounted upon said short shaft, two of the arms of said three-armed tension lever being symmetrically arranged with respect to one another, a spring acting on one arm of said three-armed tension lever, a bolt having said spring acting on said tension lever adjustably mounted thereon, a projection carried by said supporting member for guiding one end of said bolt, means whereby the opposite end of said bolt may be slidably mounted selectively in one of the two symmetric arms of said three-armed tension lever to allow operation of the machine in one or the other direction of rotation, a loose disc carried by said opposite end of said bolt forming an abutment for said spring and resting upon the mounting means of the arm of said three-armed tension lever holding and guiding said bolt, and a guide roller carried by the free end of the middle arm of said three-armed tension lever, both of said guide rollers being arranged outside the periphery of said brakable disc in the path of the unrolling tape.

3. A taping machine having a tension device and a braking device allowing braking of the roll of tape depending upon a determined tension of the tape, comprising a shaft mounted in a stationary bearing, a carrier for the roll of tape rotatably mounted on said shaft, a brakable disc forming part of said carrier, a supporting member fixed upon said shaft, a short shaft carried by said supporting member, a brake lever pivoted on said short shaft and adapted to cooperate with said brakable disc, a guide roller carried by the free end of said brake lever, a three-armed tension lever also pivotally mounted upon said short shaft, two of the arms of said three-armed tension lever being symmetrically arranged with respect to one another, said brake lever having mounted thereon an extension member forming a stop with which the two symmetrical arms of said three-armed tension lever may cooperate to limit their oscillating path, a spring acting on one arm of said three-armed tension lever, a bolt having said spring acting on said tension lever adjustably mounted thereon, a projection carried by said supporting member for guiding one end of said bolt, means whereby the opposite end of said bolt may be slidably mounted selectively in one of the two symmetric arms of said three-armed tension lever to allow operation of the machine in one or the other direction of rotation, a loose disc carried by said opposite end of said bolt forming an abutment for said spring and resting upon the mounting means of the arm of said three-armed tension lever holding and guiding said bolt, and a guide roller carried by the free end of the middle arm of said three-armed tension lever, both of said guide rollers being arranged outside the periphery of said brakable disc in the path of the unrolling tape.

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