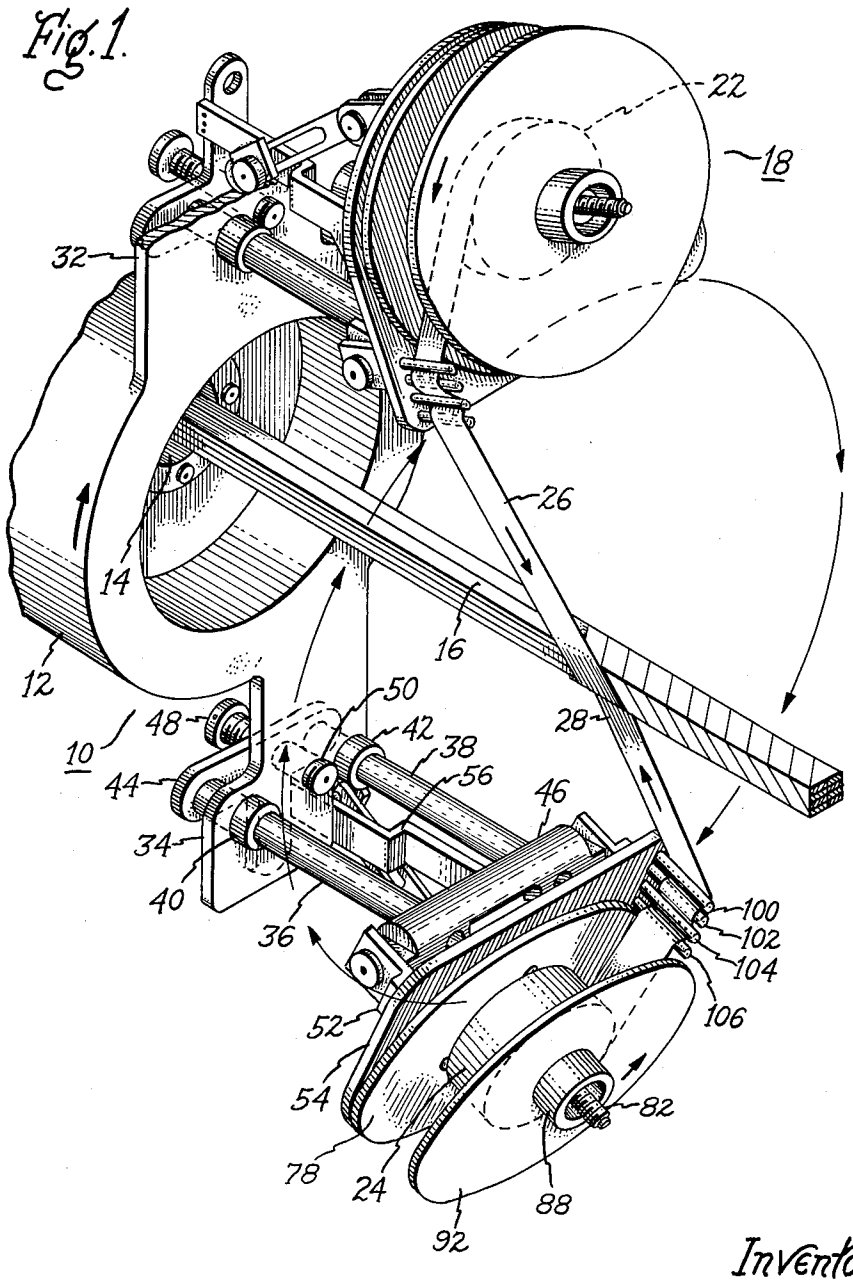
June 23, 1964 R. H. BAILEY 3,137,985

TAPING HEAD

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Fig. 1.



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TAPING HEAD

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Fig. 2.

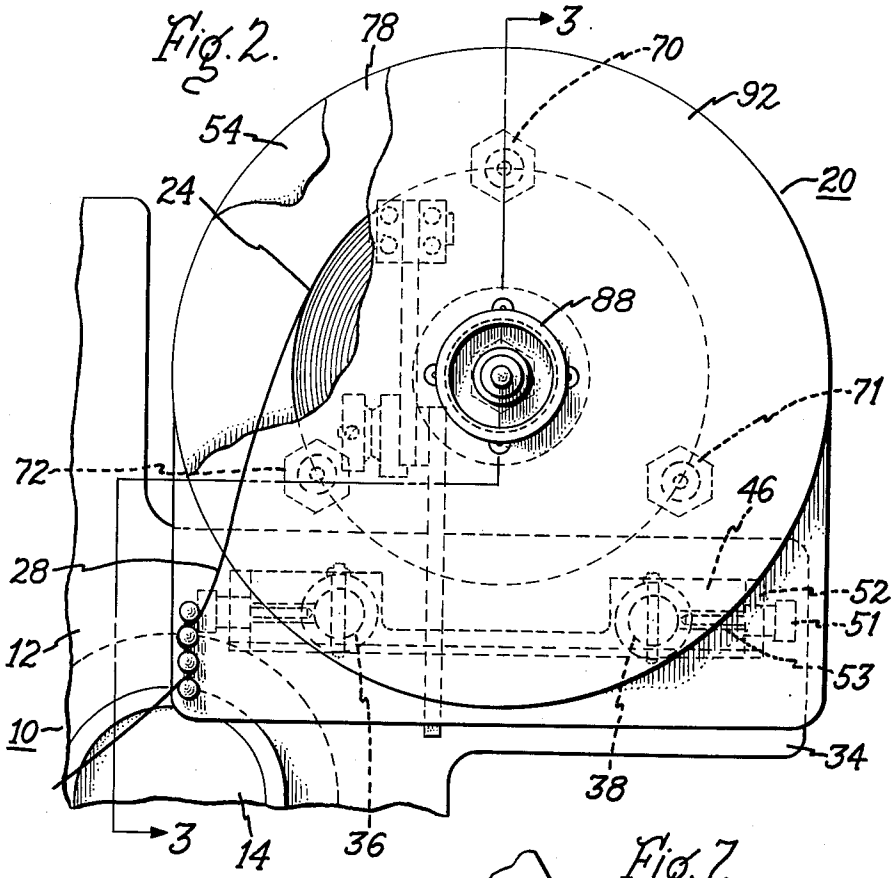


Fig. 7.

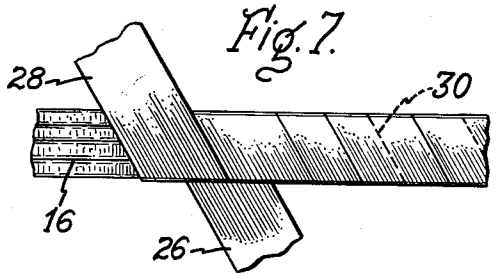
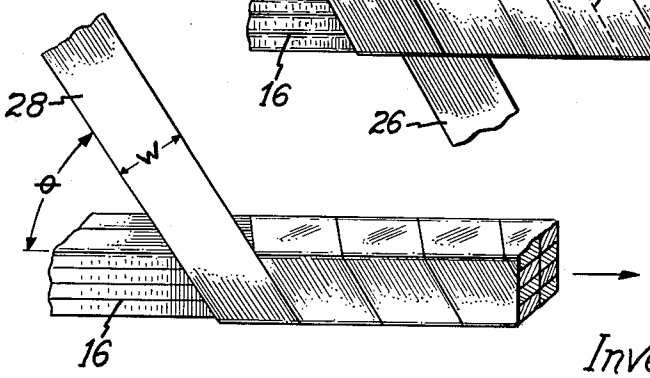


Fig. 6.



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TAPING HEAD

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Fig. 3.

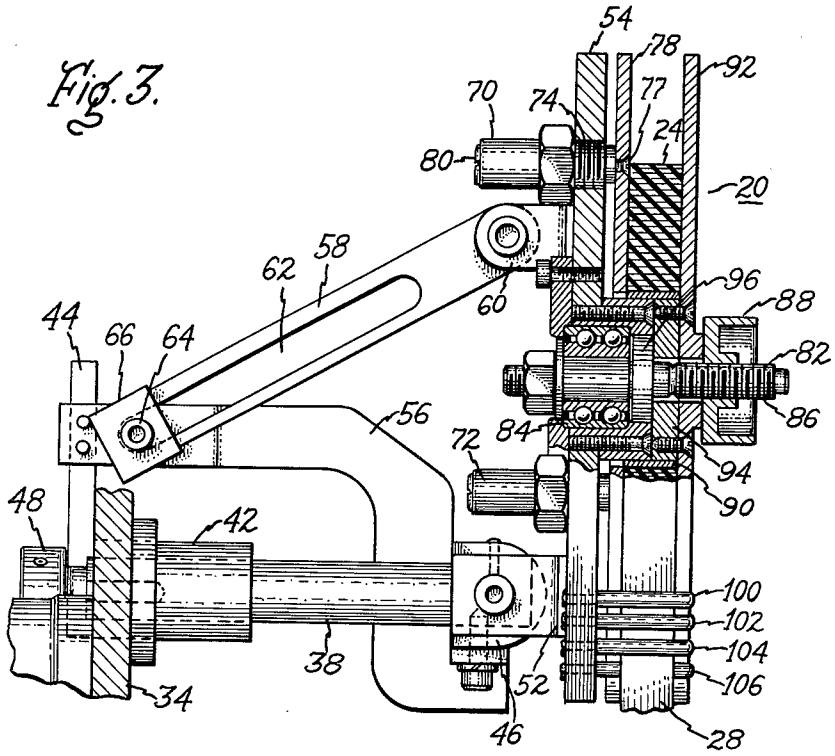


Fig. 4.

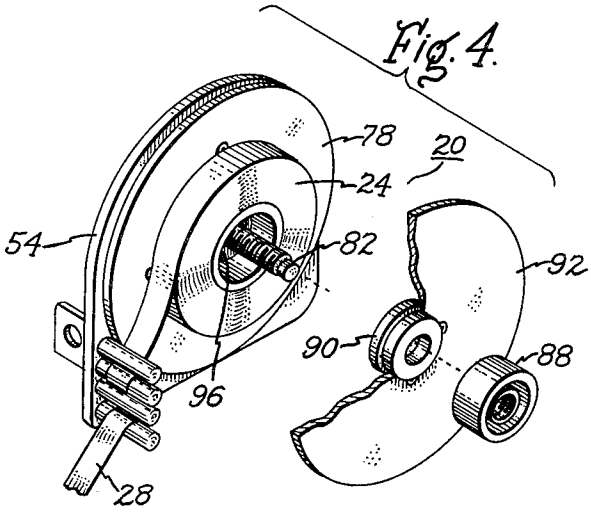
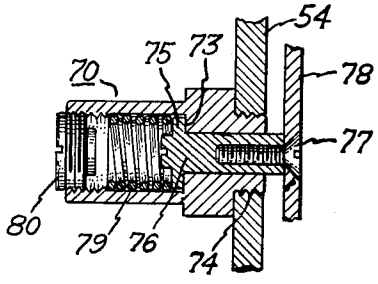


Fig. 5.



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United States Patent Office 3,137,985 Patented June 23, 1964

3,137,985

TAPING HEAD

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Filed July 2, 1962, Ser. No. 206,723
6 Claims. (Cl. 57—13)

This invention relates to a taping head for wrapping insulating tapes about an electrical conductor, and more particularly, to an improved taping head for providing such wrappings.

In the electrical field, and especially in that portion which pertains to electrical apparatus, it is well known that numerous types of electrical conductors are required. These conductors vary from very small solid conductors, and include numerous types of stranded conductors, up to very large size multi-stranded conductors in the form of transposed cable. Transposed cable is generally a large electrical conductor which is formed from a plurality of strands of solid electrical conductors, in which the various strands are transposed about the periphery of the cable. An example of transposed cable is shown in Patent No. 3,000,406, issued September 19, 1961. In the various types of electrical conductors which are utilized in the electrical apparatus field, it is generally found necessary to provide some type of insulation coating about the conductor. One such well-known coating takes the form of a resinous enamel coating which is placed on the conductor, by known means, as a continuous film. Another type of insulation is an insulating tape covering which is wrapped about the conductor by means of a taping head.

A taping head applies the insulation to the conductor by uniformly wrapping a desired number of tapes of insulating material concentrically about a conductor moving through the taping head. The various tapes forming the insulation on the conductor are usually applied in a plurality of layers. In applying the insulating tapes to the conductor, it is required that each tape be applied in a single layer in a uniformly tight, helical wrapping with no overlapping. A gap of approximately one-sixteenth of an inch is usually permissible in each layer between the various windings of the tape making up such layer. The various layers of tape are usually wrapped over the joint of the next lower layer to completely insulate the conductor. In order to apply each layer of tape with no overlapping of the tape in the layer, it is necessary that the tape not stray from the initial angle of wrapping in which it is set in providing the wrapping about the conductor. To prevent straying it is necessary to maintain a substantially constant tension on the tape, regardless of variations in the tape roll size, in the conductor size, or in the width to thickness of the conductor, as in rectangular conductors and rectangular transposed conductors.

The rate at which tape can be applied to a conductor generally depends on the size of the conductor, the speed of the conductor through the taping head, the width of the tape being applied, and the speed of rotation of the taping head. In general, the limiting condition in applying the tape is the rate of movement of the conductor through the taping head. However, where various types of paper tape are used for insulating a conductor, the limiting rate of application is the maximum conductor speed which can be used without tearing the paper tape. When glass tapes or other similar types of strong tape are used there is no problem of tearing and thus high application rates may be used. For example, in one transposing machine, such as is shown in Patent No. 3,000,406, the ultimate speed of movement of the conductor through the machine is approximately forty-three feet per minute. A conventional taping head mounted

on this machine will apply glass tape to the conductor at the ultimate rate of conductor movement. However, when paper tape made from strong manila paper is used the application rate drops to twenty-five feet per minute. At higher conductor speeds the tape tears, thus preventing adequate insulation wrapping. With other types of paper tapes, which have a lower tear strength than manila paper, the rate of application of the wrapper to the conductor is even less, thus further decreasing the productivity of the machine.

Due to the various cost factors involved in the various types of tape, it is desirable to use paper insulating tape wherever possible. Thus, it is found desirable to provide an improved taping head which will allow paper tapes to be applied to conductors at a high rate of application thereby improving the productivity of the insulating operation. It has been found that if the tape can be removed from the tape roll at the same rate that it is applied to the conductor, regardless of variations in the size of the roll or irregularities in the conductor, that the paper will not be subjected to tearing tensions. Also, as will be understood, due to variations in conductor size and paper width it is necessary that the taping head be sufficiently adjustable to apply various sizes of tape to any desired size of conductor.

Therefore, it is one object of this invention to provide a taping head which can apply paper tape insulation to conductors at high application rates without tearing of the paper tape.

Another object of this invention is to provide an improved taping head in which the tape is applied to a conductor at the same rate that it is removed from the tape roll.

A still further object of this invention is to provide an improved taping head which will apply tape to conductors without overlapping of the tape in a layer.

A further object of the invention is to provide an improved taping head which can be used with a transposing machine to apply tape to a conductor at the ultimate speed of the machine, regardless of the strength of the tape being applied.

Briefly, in one form, this invention comprises an improved taping head for wrapping insulating tape about a conductor. The taping head is provided with a plurality of tape roll holders mounted thereon, concentrically about a conductor opening in the taping head. Each of the tape roll holders comprises a roll tension control means for contolling the rate at which the tape is unwound from the roll, and a tape tension control means for controlling the rate at which the tape is wound on a conductor. The tape tension control means and the roll tension control means are designed so that the tape will be unwound from the roll at the same rate that it is applied to the conductor, thereby preventing tearing of the tape.

The invention which it is desired to protect will be clearly pointed out and distinctly claimed in the claims appended hereto. However, it is believed that this invention, and the manner in which its various objects and advantages are obtained, as well as other objects and advantages thereof, will be better understood from the following detailed description of a preferred embodiment thereof especially when considered in the light of the accompanying drawings in which:

FIGURE 1 is a perspective view of one form of taping head made according to this invention;

FIGURE 2 is an enlarged front view of one of the tape roll holders shown in FIG. 1;

FIGURE 3 is a side view partly in section of the tape roll holder, taken on the line 3—3 in FIG. 2;

FIGURE 4 is a perspective exploded view, partly in section, of one of the tape roll holders shown in FIG. 1;

FIGURE 5 is a sectional view of one form of roll tension control used in this invention;

FIGURE 6 is a perspective view of a stranded rectangular conductor showing a first layer of insulating tape being applied thereto; and

FIGURE 7 is a side view of a stranded rectangular conductor showing a first and second layer of insulating tape being applied thereto.

Reference will now be made to the drawings, in which like numerals are used to indicate like parts throughout the various views thereof. Referring first to FIG. 1 there is shown, in perspective view, a taping head **10** according to a preferred embodiment of this invention. The taping head **10** comprises a rotatable member **12** having a central opening **14** therein to allow a conductor, such as conductor **16**, to be moved through the taping head **10**. As will be understood, the taping head **10** may be connected to any desired type of machine through which the conductor **16** is being moved, for example, it may be connected to a transposing machine, such as that which is shown in Patent No. 3,000,406 and be utilized therein to provide insulating taping about the transposed conductor as it comes out of the machine shown in that patent. The member **12** may be rotated in any desired manner as will be understood, and no rotating means is shown since this forms no part of the present invention.

As shown in FIG. 1, the taping head **10** includes a pair of tape roll holders **18** and **20** which are mounted on the rotatable member **12** concentrically about the opening **14**. For clarity of description only two tape roll holders **18** and **20** are shown. However, it will be understood, that any desired number of tape roll holders may be used. Each of tape roll holders **18** and **20** are provided with a roll of insulating tape **22** and **24**. As can be seen from FIG. 1, as the taping head **10** rotates in a clockwise direction, as indicated by the arrow on member **12**, the tapes **26** and **28**, from the respective tape rolls **22** and **24**, will be wrapped about the conductor **16**, in the manner indicated. As the taping head **10** rotates in a clockwise direction, the tape rolls **22** and **24** will each be rotated in a counter-clockwise direction, as indicated by the arrows in **18** and **20**, in order to unwind the tapes **26** and **28** from tape rolls **22** and **24**, respectively. In this manner the tapes **26** and **28** will be wrapped about the conductor **16** to thereby provide a desired insulation for the conductor **16**.

Referring now to FIGS. 6 and 7 of the drawings, there is shown the manner in which the tape is wrapped about the conductor **16**. As earlier pointed out, in wrapping the tapes about the conductor it is necessary that the tapes be applied in a uniformly tight helical wrapping in each layer, with no overlap of the tape in the layer. Considering FIG. 6, it can be seen that the first layer of tape, in this case tape **28**, is wrapped about the conductor **16** making an included angle θ between the tape **28** and the conductor **16**. In order to properly wrap the tape **28** with no overlapping, the angle θ will be a definite value depending upon the width of the paper and the perimeter of the conductor. In general, it may be stated, that the cosign of the angle θ equals W/P; where W is the paper width and P is the perimeter of the conductor **16**. Of course, it will be obvious that in order to obtain the desired angle θ it will be necessary to adjust the position of the various tape roll holders **18** and **20** of FIG. 1, depending upon the perimeter of the conductor being wrapped and the width of the tape being utilized to wrap the conductor. FIGURE 7 shows the wrapping of the conductor **16** with two separate tapes, tapes **26** and **28**. As shown in FIG. 7, tape **28** conforms to the first layer of tape on the conductor **16** and it is wrapped along the conductor in the manner shown in FIG. 6, without any overlapping between the various wrappings of the tape **28**. The second layer of tape **26** is wrapped about the conductor **16** over the top of the first tape **28** with the center line of the tape **26** approximately coinciding with the butting joints of the first layer of tape **28**. This is shown in FIG. 7 by means of the dotted lines **30**, which conform to the joints in the first layer **28** of the tape about the conductor **16**. Of course, it will be understood that additional layers of tape can be provided on the conductor **16**, if desired. That is a third, fourth, and fifth layer of tape may be provided, for example, in the manner indicated by tapes **26** and **28**, the additional layers, of course, being wound over the layer **26**, and each other, in the same manner that layer **26** is wound over layer **28**.

Referring now to FIGS. 1 and 3 of the drawing, the manner in which the tape roll holders are adjustably mounted with respect to the rotatable member **12** of the taping head **10** will now be described. As shown in both FIGS. 1 and 3, the tape roll holders **18** and **20** are mounted on the rotatable member **12** by means of flange members **32** and **34**. Since each of the tape roll holders are mounted in the same manner, only the mounting of tape roll holder **20** will be described. The tape roll holder **20** is mounted for horizontal movement in flange member **34** of the rotatable member **12** by means of a pair of rigid bar members **36** and **38** which are slidably mounted in bushing members **40**, **42**, respectively in the flange member **34**. One end of bar members **36** and **38** is secured to a T-shaped plate member **44** while the opposite ends are secured to a mounting member **46**. The T-shaped member **44**, located behind the flange **34**, is mounted on a threaded member **48** by a rotatable bearing such that the T-shaped member **44** and threaded member **48** move together as a unit. The threaded member **48** is threaded into a tapped opening **50** in flange member **34** such that by rotation of screw member **48** the T-shaped member **44** and the rigid bar members **36** and **38** will move with respect to the flange member **34**. The mounting member **46** is mounted in a yoke piece **52** which is rigidly secured to the backing plate **54** of the tape roll holder **20**. Member **46** is pivotally mounted in yoke member **52** by pin member **51**, extending through yoke member **52** into bearings **53** in mounting member **46**, as can be more clearly seen from FIG. 2. The mounting is such that the tape roll holder **20** may be pivoted about the axis of the member **46**. In order to more firmly secure the member **46** and prevent vibration thereof, a strengthening member **56** is provided, extending from the mounting member **46** to an edge of the T-shaped member **44**, the ends of member **56** being rigidly secured to both the mounting member **46** and the T-shaped member **44**. By means of the above discussed mounting members the tape roll holder **20** may be readily moved in a horizontal plane with respect to the flange member **34**, to position it in a desired manner with respect to the other tape roll holders concentrically mounted about the taping head **10**. Of course, it will be understood that the tape roll holder **18**, and any other tape roll holders which are mounted about the taping head **10**, will be movably mounted in a similar fashion to that explained hereinbefore with reference to the tape roll holder **20**.

In order to provide the desired angular relation between the insulating tape and the conductor, the tape roll holder must also be pivotal with respect to the vertical axis. This is necessary to provide the desired taping angle θ with respect to the conductor **16** extending through the taping head **10**, as previously explained. The pivotal mounting is shown in FIGS. 1, 2 and 3 and it is believed best explained with reference to FIG. 3. As shown in FIG. 3 of the drawing, an adjusting member is provided in the form of a link **58**, pivotally secured to the back plate **54** of the tape roll holder **20** by a boss **60**. A large slotted opening **62** is provided substantially throughout the major portion of the length of the adjusting link **58**. Link **58** is secured to the strengthening member **56** by means of a threaded bolt **64** extending through slotted opening **62**. Mounted on the threaded bolt **64** and movable therewith is a locking member **66**. Locking mem-

ber 66 is forced against the side of link member 58 by means of the threaded member 64. As will be understood, when the threaded member 64 is loosened, to thereby loosen lock member 66, the adjusting link 58 may be moved, by means of the slot 62, to thereby pivot the tape roll holder 20 about the yoke member 52 and position it at any desired angle. When the desired angle is obtained, the threaded member 64 is again tightened, forcing lock member 66 against link 58. The link 58 is thus firmly secured between the strengthening bar 56 and lock member 66. In this manner, it will be seen that the tape roll holder 20 may be adjusted to any desired angle with reference to the conductor 16 extending through the rotating tape head 10, and be firmly secured at such angle by means of the locking member 66 and the threaded member 64. Thus, as hereinbefore described, the tape roll holders are movably mounted on the taping head 10 so as to be readily movable in a horizontal direction, and to be pivotal about a vertical axis so as to properly position the various tape roll holders with respect to each other, and also to provide the desired angle of taping with respect to the conductor extending through the taping head.

In order to provide the desired tension on the tape which is mounted in the tape roll holder, each tape roll holder is provided with a tape roll tension control means, and with a tape tension control means. The tape roll tension control means is utilized to control the rate at which the tape is unwound from the tape roll secured to the tape roll holder. The tape tension control means controls the rate at which the tape is wrapped about a conductor moving through the taping head. These two tension means combine to provide a constant tension on the tape means so as to obtain the desired uniformly tight helical wrapping about the conductor and also to prevent excessive tension from being applied to the tape as it is being wound about the conductor. In FIGS. 3 and 5 the tape roll tension control means are most clearly shown.

Referring to FIG. 3 of the drawing, it can be seen that the back plate 54 of the tape roll holder 20 is provided with a plurality of spring-loaded tension fasteners. In general, three spring-loaded tension fasteners are provided, as indicated at 70, 71 and 72 in FIG. 2. Only two are shown in FIG. 3, that is, the spring-loaded tension fasteners 70 and 72. The spring-loaded tension fastener 70 is shown in detail in a sectional view in FIG. 5. The spring-loaded tension fastener 70 may be secured to the back plate 54 by threading, welding, or in any other desired manner.

Referring now to FIG. 5, it can be seen that the spring-loaded tension fastener 70 is threaded through the back plate 54, as indicated by the hollow threaded portion 74. A spring-loaded plunger 76 is mounted within hollow portion 74 of the spring-loaded tension fastener 70. Plunger 76 is provided at one end with a shoulder 75 which butts against a shoulder 73 formed in fastener 70, as shown. The other end of plunger 76 is secured to a non-rotating disk brake 78 by counter-sunk screw 77. The spring loaded plunger 76 extends beyond the backing plate 54 and against disk brake 78 in the manner shown in FIG. 5, when shoulders 73 and 75 are in contact. A spring member 79 is placed in the fastener 70, butting against the shoulder 75 of the plunger 76. A closure member 80 is threaded into the end of fastener 70, as shown, compressing spring 79, and forcing shoulder 75 into contact with shoulder 73. The spring-loaded tension fasteners 71 and 72 are secured to back plate 54 and to the disk brake 78 in a similar manner, and are also provided with spring members, such as spring 79. By means of this mounting, the disk brake 78 is spring mounted on the back plate 54, such that it may be moved toward the back plate 54, against the compression of the springs 79 when a tape roll is mounted thereon.

Reference will now be made to FIG. 3 of the drawings

for a description of the tape roll mounting. In order to secure a tape roll to the tape roll holder 20 a spindle member 82 is provided, mounted in a bearing 84 within the back plate member 54. The spindle member 82 is rotatable within bearing member 84 and is provided with exterior threads 86 on which a retaining nut 88 may be threaded. The paper roll 24 is mounted on a hub member 90 which is secured to a retaining plate 92 in the manner best shown in FIG. 4. The retaining plate 92 is mounted on the spindle 82 and is pressed against the tape roll 24, forcing the tape roll 24 against the disk brake 78, by means of the retaining nut 88. The retaining plate 92 is also provided with a raised central portion 94, which may be integral with hub 90. The size of the raised portion 94 is determined by the width of the tape roll 24. The raised center portion 94, which fits about the spindle 82, is of a height or thickness such that when the retaining nut 88 is threaded securely on the spindle 82, the raised member 94 will be in contact with the shoulder 96 of the spindle 82, which runs in bearing 84, mounted in plate 54. As will be understood, when raised member 94 contacts shoulder 96, the tape roll 24 will move disk brake 78 toward backing plate 54, placing the springs 79 in compression. Thus, disk brake 78 will apply a constant force against the tape roll 24.

From the above, it will be seen that the same tension is applied by the static disk brake 78 against the roll 24, and the retaining plate 92, since the retaining nut 88 is always tightened until raised member 94 contacts spindle shoulder 96. When different width tapes are used, a different thickness or height of the central member 94 is provided such that the same tension will always be applied by the spring-load tension fasteners and the disk brake 78 against the tape roll and the retaining plate. Of course, it will be understood that the hub member 90 on which the tape roll 24 is mounted will be of the proper size such that it will not contact the brake disk 78 when the retaining nut 88 is tightened as far as possible on the spindle member 82. As will be understood by those skilled in the art, as the tape roll holders are rotated, in the manner indicated in FIG. 1 of the drawing, the tape will be rotating in a counter-clockwise direction as the taping head rotates in a clockwise direction and a constant tension will be applied against the roll of tape within the tape holder by means of the brake disk 78. This tension, in general, will be predetermined by means of the loading springs 79 and will remain constant, regardless of the width of the tapes and the thickness of the tapes which are used in the taping head.

As will be understood, the tension applied by braking disk 78 to the tape roll 24 is determined by the springs 79. These springs will all be identical so as to apply a uniform tension against the tape roll 24. The exact dimensions of the spring 79 will depend to a great extent on the mass of the tape roll which is used in the tape roll holder. The tension applied to the brake disk 78 must be sufficient to prevent the tape from being unwound from the roll at a faster rate than it is being applied to the conductor. This problem is generally most pronounced where the tape roll is full and the greatest mass is present tending to unwind the tape. However, as the tape is wound on the conductor, thus decreasing the mass of the tape roll, the tension must not be so great as to cause the tape to tear in being unwound from the roll against the tension of the disk brake. As will be understood by those skilled in the art, the proper size spring can only be determined by a cut and try method.

The tape tension means takes the form of a plurality of fingers 100, 102, 104, and 106, which are firmly secured to the back plate 54 of the tape roll holder 20. In order to obtain the desired tape tension the tape 28 is threaded through the fingers, the more fingers through which it is threaded the greater being the tension of the tape. As will be appreciated, the tension provided by the fingers 100, 102, 104, and 106 will be varied with

respect to the size of the tape so as to provide the desired tape tension with respect to the tape roll tension provided by the brake disk 78. However, for any given size of tape the tape tension will remain constant and therefore once the desired threading within the tape tension finger has been determined then it may be utilized in all instances when using this particular size of tape.

As will be understood the tape roll tension control means and the tape tension control means comprises an integral system which between them govern the rate with which the tape is unrolled from the roll and the rate with which the tape is wrapped about the conductor means. By properly adjusting the two control means it is possible to obtain the same rate of unwinding from the roll as the rate of winding about the conductor. When this is obtained, it is possible to wind tape about a conductor at the ultimate speed at which the conductor is able to pass through the taping head without regard to the strength or weakness of the tape which is being wrapped about the conductor. That is, by means of controlling these tensions and making them equal, the tension applied to the tape being wrapped is at all times constant and there is no tearing of the tape.

From the above it will be seen that, this invention provides an improved taping head in which the various tape roll holders of the taping head may be mounted in any desired manner with reference to a conductor movable therethrough such that the tape may be wrapped about the conductor to provide the desired uniform helical wrapping without overlapping of the various layers thereof. Further, by means of the improved taping head herein disclosed, it is possible to provide a taping head in which the tape is wrapped upon the conductor as fast as it is unwound from the tape roller, regardless of the centrifugal forces or the irregularities of the shape of the conductor. Thus it is possible to wrap tape about a conductor at an extremely fast rate without regard to the strength or weakness of the tape being used thereon.

While there has been shown and described the present preferred embodiment of the improved taping head of this invention, it will be understood that various constructional changes could be made in the mounting of the tape roll holders and in the means of adjusting them, as well as in the manner of applying the desired tension without departing from the spirit and scope of the invention as set forth in the appended claims.

What is claimed as new and which it is desired to secure by Letters Patent of the United States is:

1. An improved taping head for wrapping insulating tape about an electrical conductor comprising a rotatable head member, said member having an opening through which a conductor may be moved, a plurality of tape roll holders mounted on said rotatable member concentrically about said opening, each of said tape roll holders being provided with a roll tension control means and a tape tension control means, said roll tension control means controlling the rate at which tape is unwound from a tape roll secured to said tape roll holder, said roll tension control means comprising a spring-loaded flat plate member applying a constant braking force against the entire side of a tape roll secured to said tape roll holder, said tape tension control means controlling the rate at which the tape is wrapped about a conductor moving through the taping head, said tape tension control means and said roll tension control means comprising an integral system whereby the rate of unwinding the tape from the roll is the same as the rate of wrapping such tape about the conductor.

2. An improved taping head as claimed in claim 1 in which said tape tension control means comprises a plurality of fingers mounted on said tape roll holder, one end of each of said fingers being secured to said tape roll holder, the tape tension being determined by the number of said fingers through which the tape is threaded.

3. An improved taping head for wrapping insulating tapes about an electrical conductor comprising a rotatable head member, said member having an opening through which a conductor may be moved, a plurality of tape roll holders movably mounted on said rotatable member concentrically about said opening, each of said tape roll holders being provided with means whereby it may be moved in a direction parallel to the direction of conductor travel through the taping head, said tape roll holder also being provided with a pivotal mounting means whereby each said tape roll holder may be pivotally adjusted about an axis perpendicular to the direction of travel of a conductor moving through said taping head, each of said tape roll holders being provided with a roll tension control means and a tape tension control means to thereby control the rate at which tape is unwound from a tape roll secured to said tape roll holder and the rate at which the tape is wrapped about a conductor moving through the taping head, said roll tension control means comprising a spring-loaded flat plate member applying a constant braking force against the entire side of a tape roll secured to said tape roll holder, said control means comprising an integral system for equalizing the rate of unwinding the tape from the roll to that of the rate of wrapping the tape about a conductor.

4. An improved taping head as claimed in claim 3 in which said tape tension control means comprises a plurality of fingers mounted on said tape roll holder, one end of each of said fingers being secured to said tape roll holder, the tape tension being determined by the number of said fingers through which the tape is threaded.

5. An improved taping head for wrapping insulating tapes about an electrical conductor comprising a rotatable head member, said member having an opening through which a conductor may be moved, a plurality of tape roll holders movably mounted on said rotatable member, concentrically about said opening, each of said tape roll holders being provided with a roll tension control means and a tape tension control means, said roll tension control means comprising a flat spring-loaded pressure plate for controlling the rate at which tape is unwound from a tape roll secured to said tape roll holder, said flat pressure plate applying a constant braking force against the entire side of a tape roll secured to said tape roll holder, said tape tension control means comprising a plurality of fingers mounted upon said tape roll holder for controlling the rate at which tape is wrapped about a conductor moving through the taping head, one end of each said fingers secured to said tape roll holder, the tape tension being determined by the number of said fingers through which the tape is threaded, said tape roll tension control means and said tape tension control means providing an integral system for equalizing the rate at which said tape is unwound from said roll and the rate at which said tape is wrapped about said conductor.

6. An improved taping head for wrapping insulating tapes about an electrical conductor comprising a rotatable head member, said member having an opening through which a conductor may be moved, a plurality of tape roll holders movably mounted on said rotatable member, concentrically about said opening, each of said tape roll holders being provided with a roll tension control means and a tape tension control means, said roll tension control means comprising a spring-loaded pressure plate for controlling the rate at which tape is wound from a tape roll secured to said tape roll holder, said spring-loaded pressure plate being mounted on said tape roll holder by means of a plurality of spring-loaded plungers, each of said spring-loaded plungers being spring mounted in a fastener means secured to said tape roll holder, said pressure plate applying a constant braking force against the side of a tape roll secured to said tape roll holder, said tape tension control means comprising a plurality of fingers mounted upon said tape roll holder for controlling the rate at which tape is wrapped about a conductor moving through the taping head, said tape roll

tension control means and said tape tension control means providing an integral system for equalizing the rate at which said tape is unwound from said roll and the rate at which said tape is wrapped about said conductor.

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