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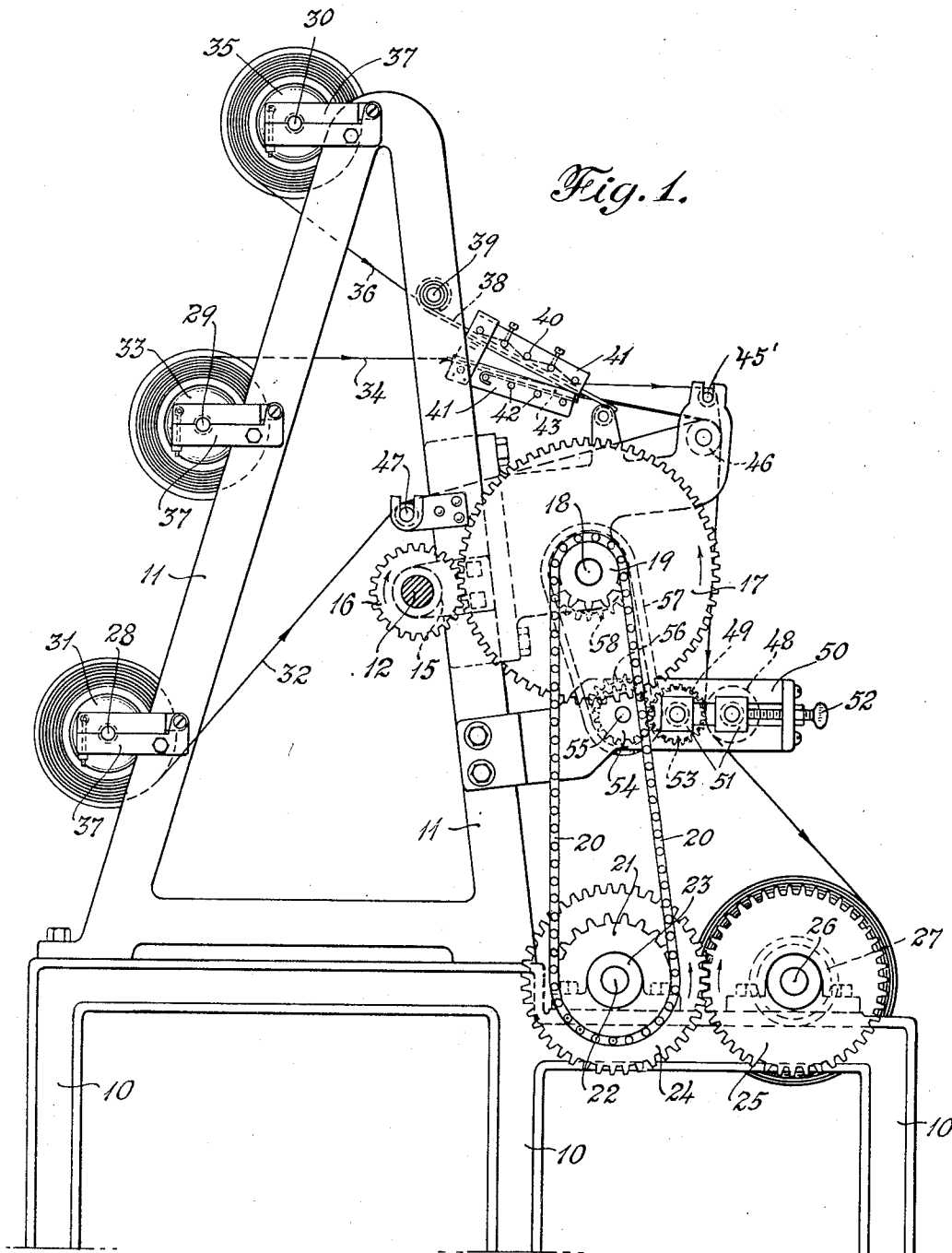
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2,396,466

APPARATUS FOR MAKING MASKING TAPES

Filed Oct. 20, 1943

3 Sheets-Sheet 1



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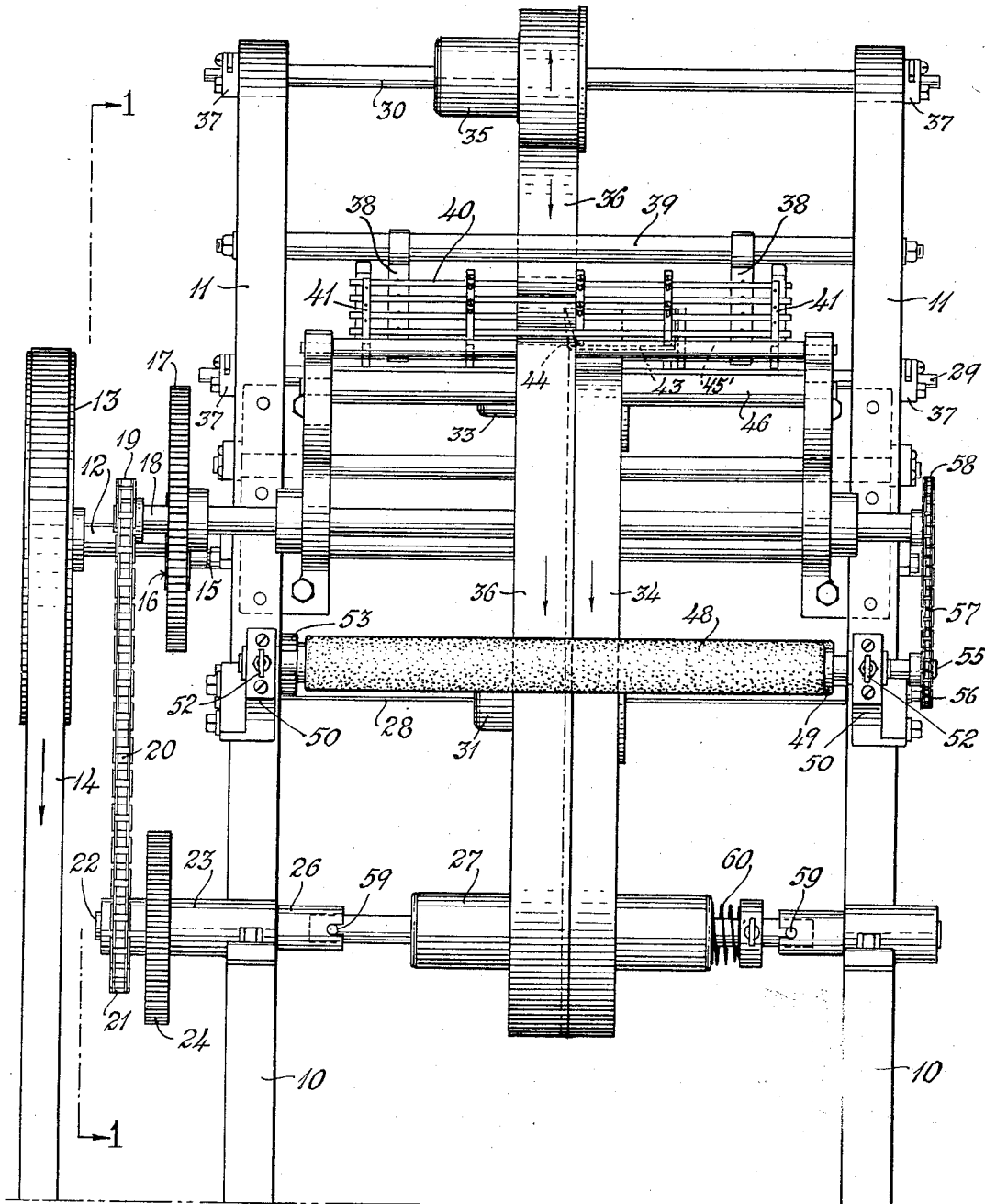
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Fig. 2.



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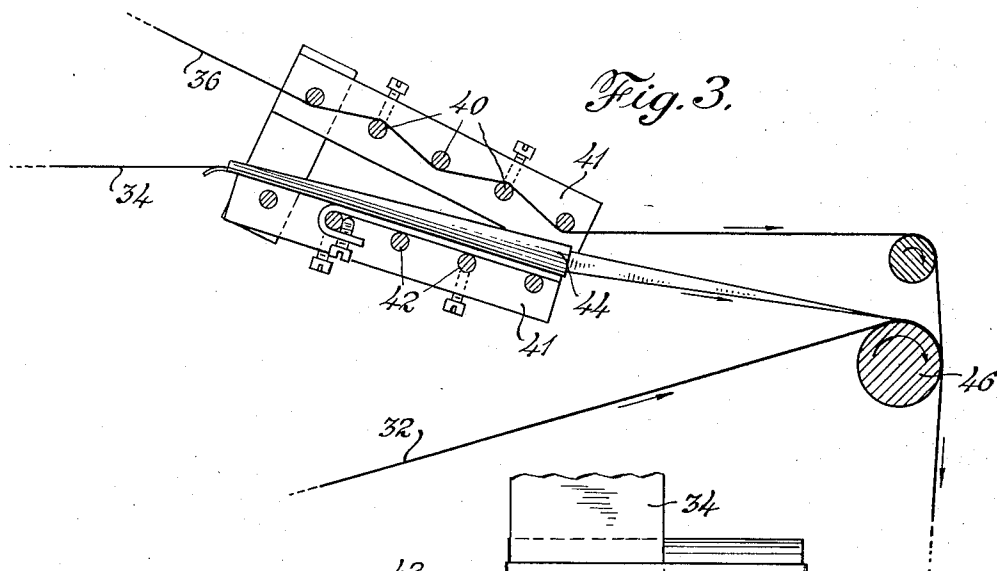


Fig. 4.

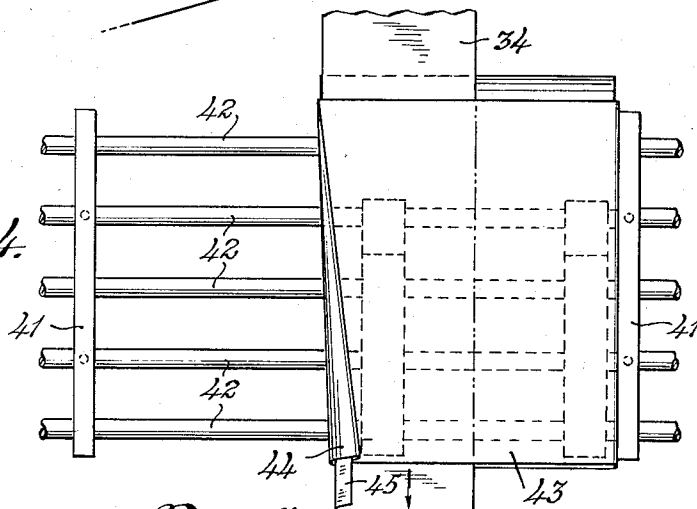


Fig. 5.

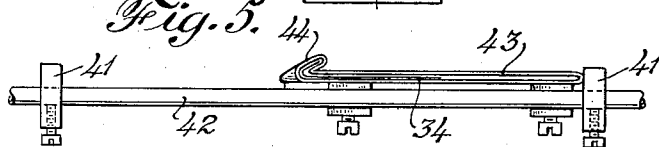


Fig. 6.

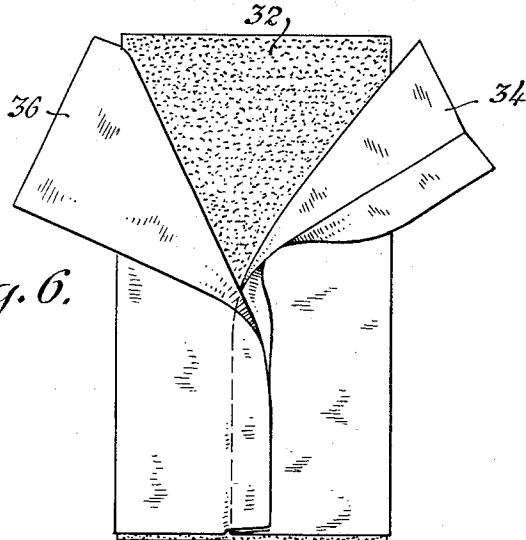
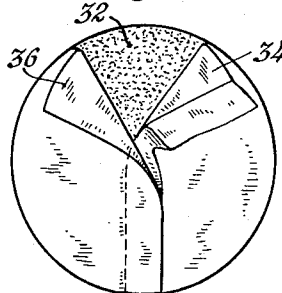


Fig. 7.



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APPARATUS FOR MAKING MASKING TAPE

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7 Claims. (Cl. 154—1)

The invention relates to an apparatus for making masking tape, i. e., an industrial tape comprising a tape of sheet material, for instance paper, having one surface thereof provided with an adhesive. Such adhesive covered surface of the tape is conventionally provided with two coextensive sheets of parchment paper of a total width approximating that of the tape, in such manner that the covering sheets of parchment can be readily stripped off the adhesive surface of the tape, and the tape applied to the surface to be covered by means of the adhesive.

A specific commercial application of this general type of industrial tape is to cover the dial surfaces, for instance, of an instrument panel of an airplane or automotive vehicle, to mask such dial surfaces while the surrounding board surface and adjacent parts of the airplane or vehicle are being cleaned or sprayed with paint. After the cleaning or spraying operation is completed and the airplane or vehicle has been delivered, the masking tapes are stripped off the dial surfaces of the instrument panel.

One form of such industrial tape heretofore supplied to airplane and automotive vehicle manufacturers is a type in which there is provided a longitudinally extending central strip of paper throughout the length of the adhesive surface of the tape. This central longitudinal strip has to be applied to the adhesive surface of the tape before the parchment paper strips are secured to such surface, and its function is to permit the ready stripping off of such parchment paper strips as the adhesive tape, in the form of small masks exactly the configuration of the dial, is being applied to the dial surfaces.

A serious objection to the use of such longitudinally extending central strip of paper is present because when the mask, made of the tape, is placed upon the instrument dial surface, all of the surface of the mask is not adhesively in contact with the dial surface and therefore dust or sprayed paint particles can get on the dial surface at the portions thereof covered by the central longitudinal strip. The dust or sprayed paint particles, finding their way to this small portion of the dial surface, must be removed when the mask is finally stripped off.

In accordance with the present invention and by the utilization of the apparatus described hereinafter, there is produced a masking tape which is free from this objection. The masking tape produced by my apparatus is constituted of the same type of adhesively coated, strip of paper, linen or the like as that of the prior art. However,

instead of using a plain longitudinally extending central strip of paper and two coextensive sheets of parchment upon the adhesive coated surface of the tape, I utilize two longitudinally extending parchment strips applied to the adhesive coated surface of the tape in a particular manner.

By means of my apparatus, prior to the application of one of the parchment strips to the adhesive coated surface of the tape, one of the edge portions thereof which is to be centrally disposed of the tape, is folded over, the strip, with such folded over edge extending outwardly, being then applied to the adhesive surface of the tape. Thereafter, the second strip of parchment paper is applied, by means of my apparatus, to the adhesive surface of the tape with the edge portion thereof positioned approximately superposed upon the folded over edge of the underlying strip of parchment paper.

The primary object of my invention, therefore, is to provide an apparatus which will produce an industrial tape of the general character hereinabove described, having the two strips of parchment paper applied to the adhesive surface of the tape in the manner just indicated, substantially automatically from three supply rolls of such tape and parchment paper strips, with the completed tape from which the masks are to be die-cut, wound upon a reel.

In the accompanying drawings there is illustrated a specific embodiment of my apparatus and the tape produced thereby.

In such drawings,

Fig. 1 is a side elevation of an apparatus constructed in accordance with my invention, it being a view of the machine along the lines I—I of Fig. 2;

Fig. 2 is a front elevation of the apparatus;

Fig. 3 is an enlarged detail view of the paper strip folding device and interlacing structure for straightening out the strip of paper to be superposed upon the folded strip;

Fig. 4 is a plan view of the edge folding device of one of the strips;

Fig. 5 is an end view of such folding device;

Fig. 6 is a plan view of a tape produced by my apparatus, with the paper strips shown in their position when being stripped from the adhesive coating surface of the backing tape; and

Fig. 7 is a similar view of a circular mask before its application to a circular dial surface.

Referring more particularly to the drawings, in which similar reference characters identify similar parts in the several views, 10 is a metal

frame structure for the apparatus from which extend upwardly two triangular frame members 11 between and to which are secured the various cross bars supporting the paper supply rolls, the folding mechanism, and certain of the pertinent portions of the apparatus.

The main drive shaft 12 is driven by a pulley 13 and belt 14 from an electric motor (not shown). Upon the main drive shaft 12, trunnioned in bearings 15, is keyed a main drive gear 16 meshing with a large gear 17, said large gear rotating on shaft 18. Upon an extension of such shaft 18 is a sprocket gear 19 driving a chain 20 meshing with sprocket gear 21 upon a shaft 22 supported in a bearing 23 secured to the frame 10.

Rearwardly of the sprocket gear 21 on the shaft 22, is a gear 24 meshing with gear 25 upon a shaft 26 which carries a reel 27 upon which the completed tape is to be wound.

Supported between the triangular frame members 11 upon shafts 28, 29 and 30, respectively, is the supply roll 31 for the gummed tape 32; the roll 33 of parchment paper 34, one edge of which is to be folded; and roll 35 of the parchment paper 36 which is to be superimposed upon the edge-folded paper strip.

The shafts 28, 29 and 30 are held between pairs of brackets 37 which are of the half pivoted type with means for locking the shaft ends within them.

The interlacing and folding mechanism is supported upon two bracket arms 38 extending from a bar 39 secured between the frame elements 11. Attached to the bracket arms 38 is a framework of a plurality of horizontal bars 40 connected by connecting bars 41. The upper series of bars 40 have interlaced between them the uppermost or top paper strip 36 so as to straighten and even out the surface of such paper strip. The manner of interlacing the paper strip 36 between the bars 40 is shown on an enlarged scale in Fig. 3.

A lower series of horizontal bars 42 support the folding mechanism for the lower strip 34, the folding mechanism being illustrated on enlarged scale in Figs. 3-5, inclusive.

Upon the bars 42 is positioned a former plate 43, one side of which is bent upwardly to constitute a forming or folding chute 44 of tapering length which, as the paper strip 34 passes over and between the plate 43, will automatically fold the edge 45 of such strip upon itself. The folded strip 34 will be drawn through the plate 43 with the edge 45 thereof folded over. The forming plate 43 is constituted of a double plate between the sections of which the strip 34 is adapted to pass.

As will be seen from Figs. 1 and 2, the edge folded strip 34 issues from the folding device and meets the strip 36, passing from the interlacing device over roller 45', at roller 46, the two strips continuing downwardly after being superposed, at roller 46, upon the gummed side of the tape 32 which is drawn from the roll 31 over the cradled roller 47 onto the roller 46 beneath the strips 34 and 36.

The tape 32 and the superposed strips 34 and 36 are drawn over the roller 46 and downwardly by and through tensioned rollers 48 and 49, adjustably positioned in the brackets 50 having means constituted of blocks 51 and tension screw 52 for increasing or decreasing the tension between the rollers.

The roller 49 is driven upon its shaft by gear 53 meshing with gear 54 driven by shaft 55 by

sprocket wheel 56 and sprocket chain 57 from sprocket wheel 58 on shaft 18.

The finished tape is wound upon the reel 27, positioned upon the removable portion of shaft 26 which is operatively connected to shaft 38 by means of the locking pins 59 which enter the slots provided therefor in the fixed portion of shaft 26, proper tension on the reel 27 being secured by the spring 60.

Various details, for instance, the screws for adjusting the bars 48 and 42 are deemed unnecessary to describe in detail herein.

The operation of my apparatus is as follows:

The tape having its gummed or adhesive provided surface is positioned in a roll thereof in the lowermost bracket 37; the roll of paper, the edge of which is to be folded, in the intermediate bracket 37; and the roll of strip paper to be superimposed upon the folded strip, in the uppermost bracket 37. The gummed tape 32 is then threaded over the roller 47 and the roller 46. The paper strip to be folded is threaded through the former plate and end folding chute in the folding device and over the roller 46 on top of the gummed side of the tape 32. The upper strip is threaded through the interlacing bars 40 and over the rollers 45' and 46, where it is superimposed upon the folded over strip. The three strips as a unit are then passed between the tensioned rollers 48 and 49 and upon the reel 27. As the machine operates, the automatic production of the masking tape in an endless strip will be accomplished.

The strip thus produced is shown in Fig. 6 from which are die-cut the masks of the particular configuration of the dial surfaces which they are to cover. These may be circular, oblong or any irregular shape.

In applying the masking tape to the dial surface, the composite strip is held near the dial surface and first the uppermost strip 36 is peeled off, then the intermediate strip is peeled off by grasping the same by means of its folded over edge. The underlying adhesive coated strip is then applied by pressure of the hand to the dial surface. In this way the entire dial surface is covered by a masking tape, all portions of which are in tight adhesive contact with the dial surface so as to preclude the possibility of any dirt or sprayed paint being deposited upon such surface.

While I have described a specific embodiment of my invention, it is obvious that various changes therein, particularly in the disposition and configuration of the detailed parts thereof may be made without departing from my invention.

I claim:

1. The combination, with an apparatus for making an industrial masking tape, of a supply roll for an adhesive coated tape, a supply roll for a narrower strip of covering material for said tape, and a supply roll for a second covering strip, said apparatus comprising means for withdrawing said tape and covering strips from their respective supply rolls, mechanism for folding over one of the longitudinal edge portions of one of said strips of covering material, mechanism for assembling said tape and covering strips in superposed relation and mechanism for winding the composite masking tape constituted of said adhesively coated tape and two covering strips upon a reel.

2. The combination claimed in claim 1 in which the mechanism for folding over one of the longitudinal edge portions of one of said strips of

covering material comprises a former plate having a folding chute along one edge thereof, said former plate being supported upon a plurality of horizontal bars positioned in advance of the point at which the tape and two covering strips are brought together.

3. The combination claimed in claim 1, including a plurality of horizontal bars through which one of said strips of covering material is interlaced.

4. The combination claimed in claim 1, including a pair of tension rollers for the passage of the composite masking tape therethrough, and means for adjusting the tension of said rollers.

5. The combination claimed in claim 1, including means for adjusting the position of the folding mechanism for various widths of the strip of covering material for the tape.

6. The combination in an apparatus for making an industrial masking tape having one surface thereof provided with an adhesive, of a base, a pair of triangular frame members extending upwardly from said base, a plurality of roll sup-

porting brackets extending from said triangular frame members, a roll for adhesive coated tape, two rolls for narrower strips of covering material for said tape, means for withdrawing from said rolls strips of such tape and covering material, means for folding over one of the longitudinal edge portions of one of said strips of covering material, means for superposing the second strip of covering material upon the folded over edge portion of said first strip, means for assembling the tape and strips of covering material in superposed arrangement, and a reel for receiving the composite masking tape constituted of said adhesively coated tape and two covering strips.

7. The combination claimed in claim 6, including a drive shaft, a sprocket and chain for driving the reel upon which the composite adhesively coated tape is to be wound, and a train of gears for driving the means for withdrawing the strips of adhesive coated tape and strips of covering material from their supply rolls.

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