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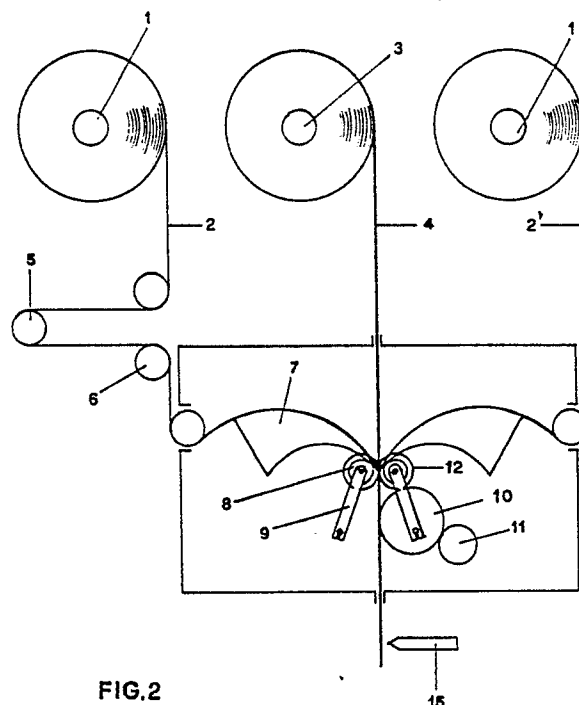
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54 **Method for protecting photographic negatives and machine for implementing the method.**

57 A method for protecting photographic negatives, characterised in that before cutting the negative into pieces, there is applied to its of each surfaces a transparent film (2, 2') having a height less than the height of the negative by an extent sufficient to leave the reference notches (13) provided in the edges of said negative (4) uncovered.



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This invention relates to a method for protecting photographic negatives, and a machine for implementing the method.

In photographic laboratories the surfaces of films have to be protected after their development and cutting, in order to prevent damage during their inevitable handling.

This protection is currently obtained by inserting each piece of negative into paper or synthetic material envelopes immediately after cutting. This method cannot be used in laboratories which implement automatic packaging, ie in those laboratories in which the individual pieces are stacked on each other for automatic insertion into wallets. This means that in current laboratories equipped for automatic packaging it is not possible to protect the pieces of negative, which therefore easily suffer deterioration, especially in the case of subsequent reuse (reorders).

It is also known to protect the complete strip of negative by various systems before cutting it into pieces, and in particular by laying in between two layers of protective film which are connected together at their previously folded longitudinal edges.

This method has however the drawback of completely covering the longitudinal edges of the negative, and consequently masking the notches provided along it for controlling the operation of the cutter.

The problem is solved according to the invention by a method for protecting photographic negatives, characterised in that before cutting the negative into pieces, there is applied to each of its surfaces a transparent film having a height less than the height of the negative by an extent sufficient to leave the reference notches provided in the edges of said negative uncovered.

A preferred embodiment of the present invention and a modification thereof are described hereinafter with reference to the accompanying drawings in which:

Figure 1 is a perspective view of a piece of photographic negative to which protection according to the invention is applied,

Figure 2 is a schematic side view of a machine for applying two protective films to a continuous negative strip, and

Figure 3 is a schematic side view as Figure 1 but showing a piece to which different protection is applied.

As can be seen from the figures the method for protecting photographic negatives according to the invention provides for the use of a machine comprising essentially a pair of rollers 1, 1' supporting reels of transparent plastic material strip 2, 2', and a roller 3 supporting the reel of photographic negatives 4 to be protected.

The height of the strip 2, 2' is slightly less than

the height of the negative 4, so that when the former is applied to the latter it does not cover the reference notches 13 provided on it.

A plurality of tensioning rollers 5 and deviator rollers 6 feed the strips 2, 2' and the negative 4 to a covering unit comprising two heating tracks 7 and two rubber presser rollers 8, both located on opposite sides of the plane along which the negative 4 advances.

Each rubber roller 8 is mounted on a corresponding mobile arm 9, and the two arms are provided with conventional members (not shown on the drawings) for opening them simultaneously, ie for rotating them in opposite directions to cause them to simultaneously withdraw from or approach the plane along which the negative 4 advances.

A gear wheel 10 is idly mounted on the rotation shaft of one of the two arms 9 and is constantly engaged with the gear wheel 11 of an electric motor (not shown). The gear wheel 10 is also engaged with a gear wheel 12 which is rigid with the corresponding roller 8 and engages with the gear wheel of the adjacent roller 8 when the two rollers 8 are in their position of maximum mutual approach.

The method according to the invention is as follows: the reels of strip 2, 2' are unwound from the rollers 1, 1', pass about the deviator rollers 6 and tensioning rollers 5, then pass along the heating tracks 7 and between the presser rollers, between which the negative 4 to protect also passes.

In passing along the heating tracks 7 each strip 2, 2' softens so that when it passes between the rollers 8 it becomes secured to the other strip 2, 2' by thermowelding through the drive perforations 14 of the negatives 4.

This procedure takes place continuously, as the presser rollers 8 not only weld the two strips 2, 2' together but also drag the composite strip after its formation.

On emerging from the rollers 8 the negative 4 is covered on both its surfaces with the strips 2, 2', which however leave the notches 13 free for use by a conventional feeler controlling the operation of the cutter 15 which cuts it into pieces of convenient length for feeding it to conventional automatic packaging equipment.

In the embodiment shown in Figure 3, for use preferably in the case of negatives which do not possess drive perforations, the strip 2, 2' is provided in proximity to its edges with two thin bands 16 of adhesive.

The bands 16 are located at a distance apart equal to the distance between the two rows of perforations 14 in the negative if this latter is provided with such perforations, and in any event at a distance apart which is clear of the photographic images themselves so as not to damage them. In

the former case the connection is even more secure because of the direct bonding between the two protective films through the drive perforations 14.

From the foregoing it is apparent that the method for protective photographic negatives has numerous advantages, including:

- a high working rate because of its continuous operation,
- the fact that the notches in the negative can still be used for automatically operating the cutter.

Claims

1. A method for protecting photographic negatives, characterised in that before cutting the negative into pieces, there is applied to its of each surfaces a transparent film (2, 2') having a height less than the height of the negative by an extent sufficient to leave the reference notches (13) provided in the edges of said negative (4) uncovered.

2. A method as claimed in claim 1, characterised in that the transparent film (2, 2') is applied to the negative by gluing its longitudinal edges along two lines external to the band occupied by the photographic images themselves.

3. A method as claimed in claim 2, characterised in that the two strip transparent films (2, 2') are joined together along the adhesive lines (16) through the drive perforations (14) in the negative.

4. A method as claimed in claim 1, characterised in that the two transparent material films (2, 2') are directly joined together by thermowelding through the drive perforations (14).

5. A method as claimed in claim 4, characterised in that the transparent films (2, 2') are heated and then made to adhere to each other by pressure through the drive perforation (14) in the negative.

6. A machine for protecting photographic negatives characterised by comprising a pair of rollers (1, 1') for supporting the covering film (2, 2') for the photographic negative (4), a roller (3) for supporting the photographic negative (4), and a thermowelding unit (7, 8) by which the covering films (2, 2') are thermowelded together through the drive perforation (14) in said negative.

7. A machine as claimed in claim 6, characterised in that the thermowelding unit (7, 8) comprises two heating tracks (7) for the two transparent material films (2, 2'), and a pair of presser rollers (8) disposed downstream of the heating tracks and arranged to press said transparent material films (2, 2') and the interpose negative (4) together.

8. A machine as claimed in claim 6, characterised in that the two presser rollers (8) are rigid with gear wheels (12) for their rotation in opposite

directions, one of the two gear wheels being engaged with a drive gear (11).

9. A machine as claimed in claim 8, characterised in that the two presser rollers (8) are mounted on arms (9) rotatable in opposite directions to cause said rollers to approach and withdraw from each other.

10. A machine as claimed in claim 9, characterised in that the support arm (9) of one of the two presser rollers (8) is rotatable about the shaft of a gear wheel (10) which is in constant engagement with the drive gear (11) and with the gear wheel (12), which is engaged with the other roller when the two rollers (8) are in their maximum approach condition.

FIG. 1

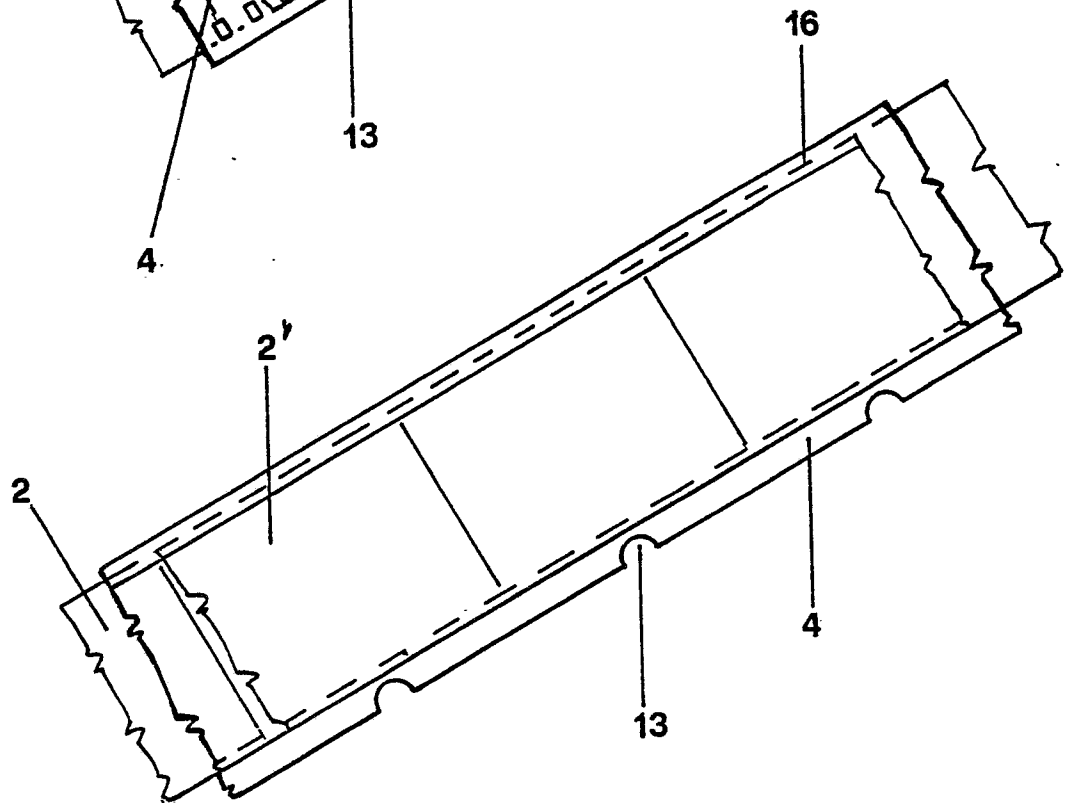
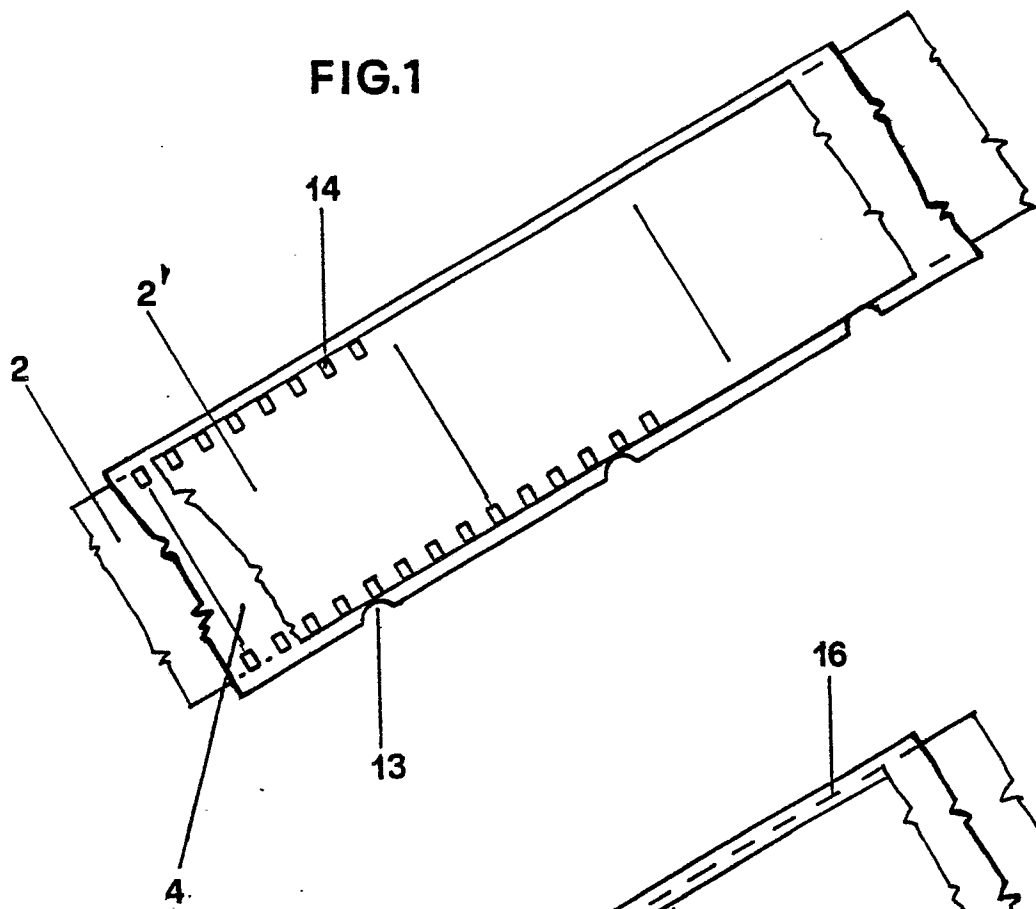


FIG. 3

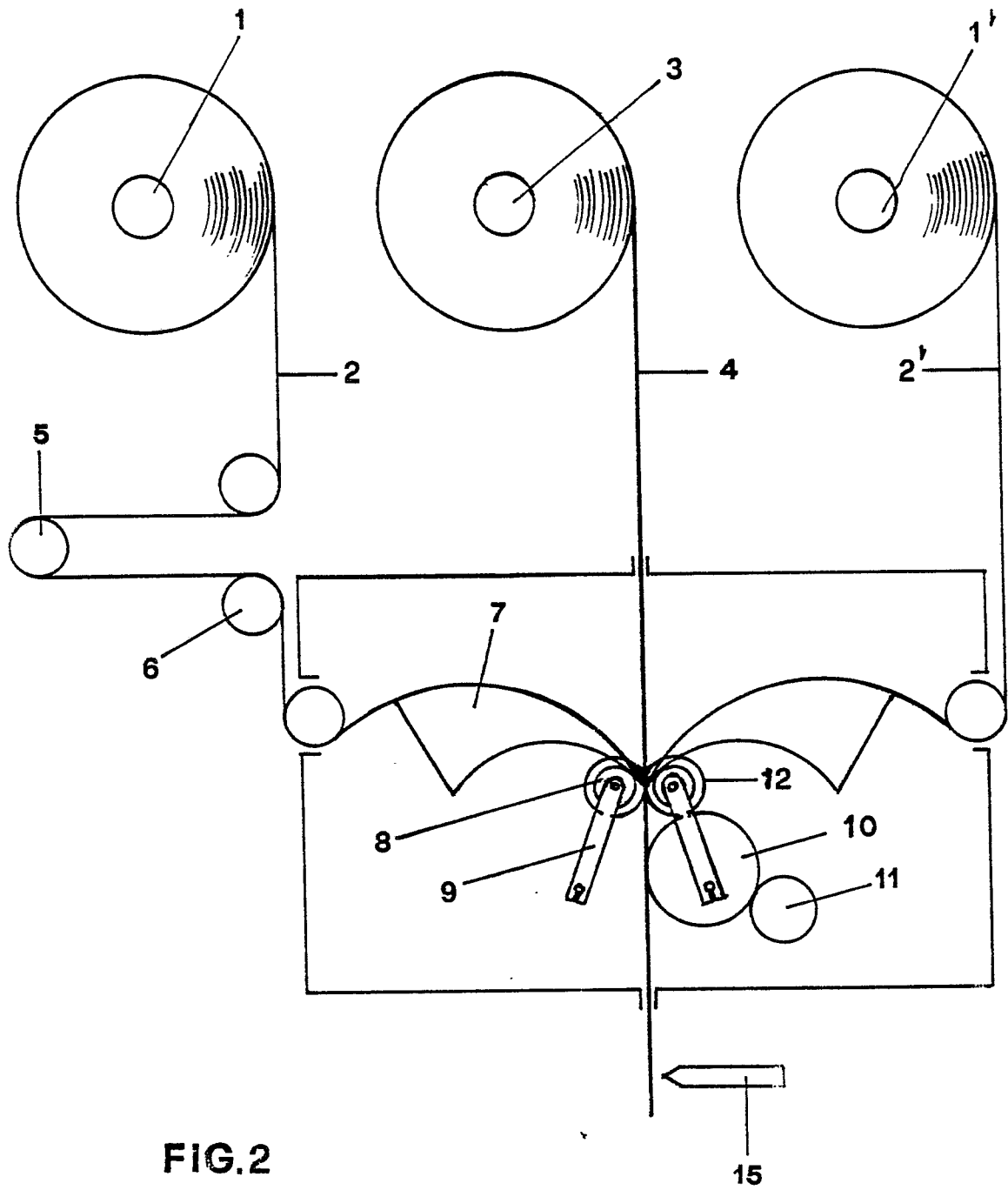


FIG.2