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(54) Marker for indelibly marking the tail ends of individual pieces of fabric with alphanumeric data relevant to that piece.

(57) The marker comprises a plate (2) mobile vertically in proximity to the sewing line between two adjacent pieces, a punch (3) for punching a tape (7) of paper or similar material, a section (t) for the linear movement of said paper tape disposed downstream of said punch, and a doctor blade (13) for distributing indelible dye and mobile along said linear section (t) in contact with said punched paper tape (7).

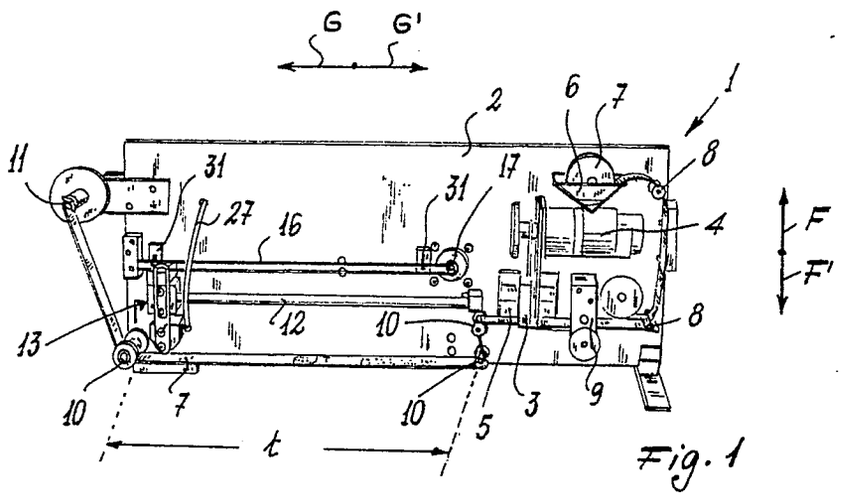

Fig. 1

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This industrial invention patent relates to a marker for indelibly marking with alphanumerical data the tail ends of individual fabric pieces forming part of a chain of pieces joined together by sewing.

This marking is currently done manually by personnel using brushes and indelible dye, the procedure obviously requiring time and involving involuntary marking errors, and in particular such manual marking cannot be read by optical readers because of the necessary disuniformity of the characters, this disuniformity being due to the urgency of writing and the continuous handwriting changes due to changes of operator.

A further drawback of manual marking is the difficulty of achieving it during the actual sewing of the tail ends in creating the chain pieces, and in fact requires the chain feed to be halted or at least slowed down.

An object of the present invention is to provide a marker ion indelibly marking the tail ends of individual pieces of fabric with alphanumerical data relevant to that piece, which considerably simplifies the operations involved in indelibly marking tail ends as currently carried out.

A further object of the invention is to provide a marker which enables alphanumeric data to be marked which are perfectly regular and resistant with time, so that they can be easily read by computerized optical readers provided for the purpose of identifying and locating various and specific pieces during subsequent working and/or storage.

These and further objects of the invention will be apparent to the expert of the art on reading the following description and claims. The marker for alphanumerical tail end data according to the invention is essentially characterised by comprising a plate mobile vertically in proximity to the sewing line between two adjacent fabric pieces, a punch for punching a tape of paper or similar material, a section for the linear movement of said paper tape disposed downstream of said punch, and a doctor blade for distributing indelible dye and mobile along said linear section in contact with said punched paper tape.

The invention is illustrated by way of non-limiting example in the figures of the accompanying drawing, in which:

Figure 1 is a front view of the marker;

Figure 2 is a detailed view showing the doctor blade in its left end-of-travel position with its head raised;

Figure 3 is a detailed view showing the doctor blade during its outward operating phase;

Figure 4 is a schematic through the doctor blade and the parts which cooperate with it; and

Figure 5 is an example of the indelible marking obtained with the marker according to the patent.

With reference to said figures, the marker, indicated overall by 1, consists essentially of a vertical plate 2 mobile in the directions of the arrows F and F′ (Figure 1) transversely to the fabric piece to be tail end marked, in proximity to the transverse sewing line between two successive pieces. The sewing machine is of the conventional type and is not illustrated herein as its arrangement relative to the piece is well known to the expert of the art.

On the front side of the plate there is a needle punch 3 of conventional type driven by a motor 4 operating on groups of several needles arranged in side-by-side rows and set in their operative positions by magnets 5 on keying-in the required type of marking, which can be alphanumerical, using a suitable conventional keyboard with a display (not shown).

Above the motor 4 there is provided on the plate 2 a cradle 6 for the free unwinding of a paper tape 7 which after passing over deviation rollers 8 is fed to a pair of stepwise drive rollers provided within a structure 9 positioned immediately upstream of the punch 3. The tape 7 passes immediately under the punch 3 where it is punched and then, passing over deviation rollers 10, lies horizontally along a section t practically in line with the lower edge of the plate 2.

A final deviation roller 10 provided at the end of the section t feeds the tape 7 to a collection roller 11 of the type rotated with the interposing of friction in order to keep the tape 7 under constant tension.

Above the section t there is provided on the front of the plate 2 a pair of horizontal side-by-side parallel guides 12, along which there slides (see Figures 2 and 3 in particular) in the directions of the arrows G and G′ a doctor blade, indicated overall by 13, for distributing indelible dye.

Said doctor blade 13 consists of a body 14 engaged on the guides 12, and on the upper part of which there is provided a block 15 which can be connected to a toothed belt which is driven in the directions of the arrows G and G′ by a motor (not shown as it is on the rear of the plate 2), on the output shaft of which there is a pulley 17, said belt turning about this latter and about a further pulley 18 provided on the opposite end of the plate 2. As can be seen in detail in Figure 3, below the pulley 18 and rigid with a block 19 supporting the guide 12 there are provided a hook-shaped cam 20 and a pair of cams 21 and 22 which together form a path extending obliquely upward and towards the end of the plate 2.

A head 24, shown in section in Figure 4, is suspended from the body 14 of the doctor blade 13 by opposing slotted bars 23. Said head 24

lowerly comprises a linear slot 25 connected to an inner chamber 26 fed with a suitable dye indelible to bleaching and to other treatment to which the pieces may be subjected during their processing through a flexible pipe 27 opening into a hole 27′ provided in said head 24. The dye is fed to the head by any device, advantageous a pressurized dye container connected to the head 24 by said pipe 27.

Within the linear slot there engages a shutter 28 the upper end of which (see Figure 3) emerges from the head 24 to comprise an aperture 29, to the rear of said head there being provided an idle roller 30 (see Figure 4) of diameter substantially equal to the width of the path defined by the cams 21 and 22.

The travel of the doctor blade 13 in the two directions (arrows G and G′) is defined and controlled by limit stops 31 positioned in the immediate vicinity of the pulleys 17 and 18.

In operation, the sensor which starts the sewing machine also causes the marker 1 to descend (arrow F′) until the already punched tape 7 lying within the section t is brought into the immediate vicinity of the tail end of the underlying fabric piece. A start signal causes the doctor blade 13 to move in the direction of the arrow G′ with the result that the hook cam 20 is released from the aperture 29, allowing the head 24 to pass from its raised position (Figure 2) to its lowered position (Figure 3) in proximity to the tape 7 as its roller 30 passes between the cams 21 and 22. The particular purpose of the cam 20 is to move the shutter 28 in order to keep the linear slot 25 clean. After reversal of travel (arrow G), the doctor blade 13 again assumes the raised position shown in Figure 2 as its roller slides between the cams 21 and 22.

The tape 7 will already have punched with an inscription such as that shown by way of example in Figure 5. The perforations provided by the punch 3 are in perfectly aligned and uniform arrangement, so that the inscription can be easily read by an optical reader for the reasons initially stated. The keyboard display screen enables typing errors to be avoided, and the inscription can be quickly changed before each sewing operation, according to requirements.

Claims

1. A marker (1) for the indelible tail end marking of alphanumerical data concerning each fabric piece forming part of a chain of pieces jointed together in succession by sewing, characterised by comprising a plate (2) mobile vertically (F, F′) in proximity to the sewing line between two adjacent pieces, a punch (3) for punching a tape (7) of paper or similar material, a section (t) for the linear movement of said paper tape disposed downstream of said punch, and a doctor blade (13) for distributing indelible dye and mobile along said linear section (t) in contact with said punched paper tape (7).

2. A marker as claimed in claim 1, characterised in that said doctor blade (13) consists of a body (14) caused to move horizontally along said plate (2) above said section (t), and a head (24) suspended from said body (14) by articulated and/or sliding means (23), said head assuming a position raised above said paper tape at the end of each operating cycle, and a lowered position in contact with said paper tape during each operating cycle.

3. A marker as claimed in claim 2, characterised in that the means for moving the doctor blade (13) consist of at least one guide (12) cooperating with said doctor blade body (14), and an endless belt (16) associated with said body (14) and driven by a motor.

4. A marker as claimed in one or more of the preceding claims, characterised in that said head (24) of said doctor blade (13) is caused to move from its raised position to its lowered position by cams (21, 22) carried by said plate (2) in a position corresponding with the point of commencement of the operating cycle.

5. A marker as claimed in one or more of the preceding claims, characterised in that said head (24) lowerly comprises a linear slot (25) connected to an inner chamber (26), said inner chamber being fed with said indelible dye.

6. A marker as claimed in claim 5, characterised in that said linear slot (25) is engageable by a shutter element (28) mobile vertically by engagement with a hook-shaped cam (20) provided in a position corresponding with the point of commencement of the operating cycle.

7. A marker as claimed in claim 6, characterised in that said shutter element (28) comprises an aperture (29) external to said head (24) and arranged to cooperated with said hook-shaped cam (20).

8. A marker as claimed in one or more of the preceding claims, characterised in that said punch (3) consists of needles arranged in groups of several side-by-side rows and controlled in any manner to form perfectly aligned and uniform inscriptions and/or symbols which can be read by optical readers possibly associated with data processors.

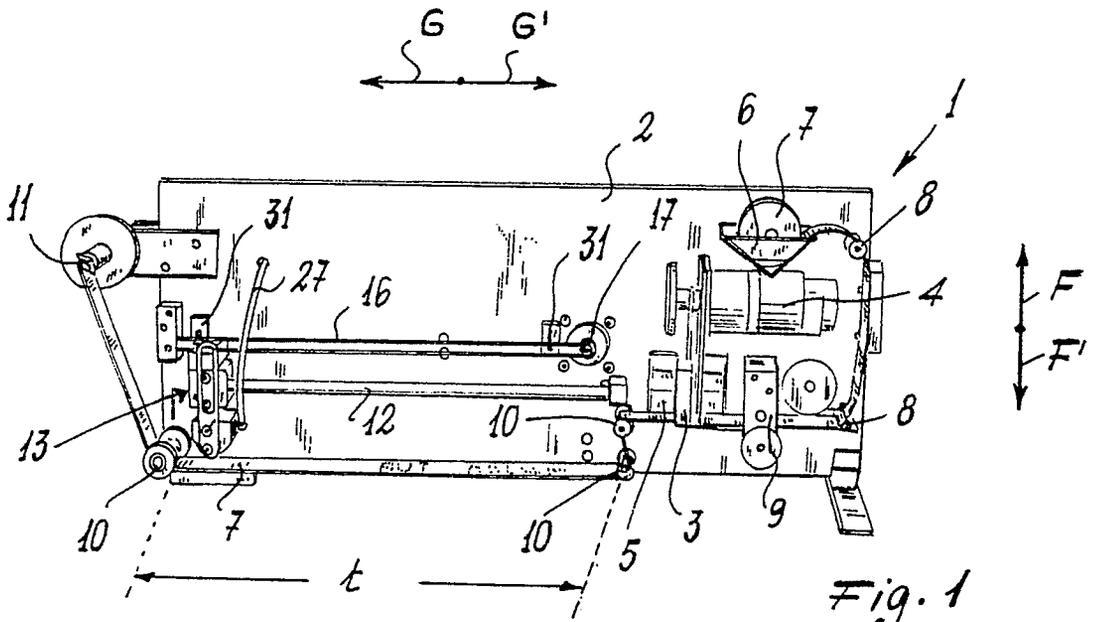

Fig. 1

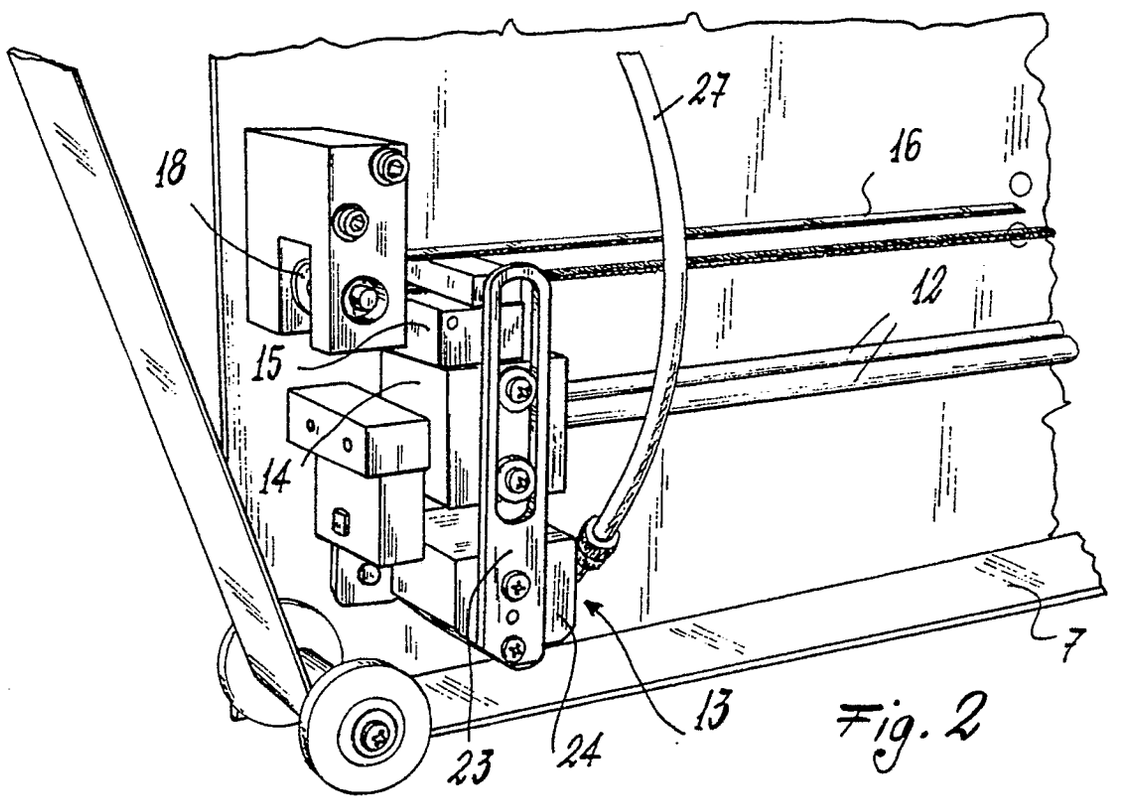

Fig. 2

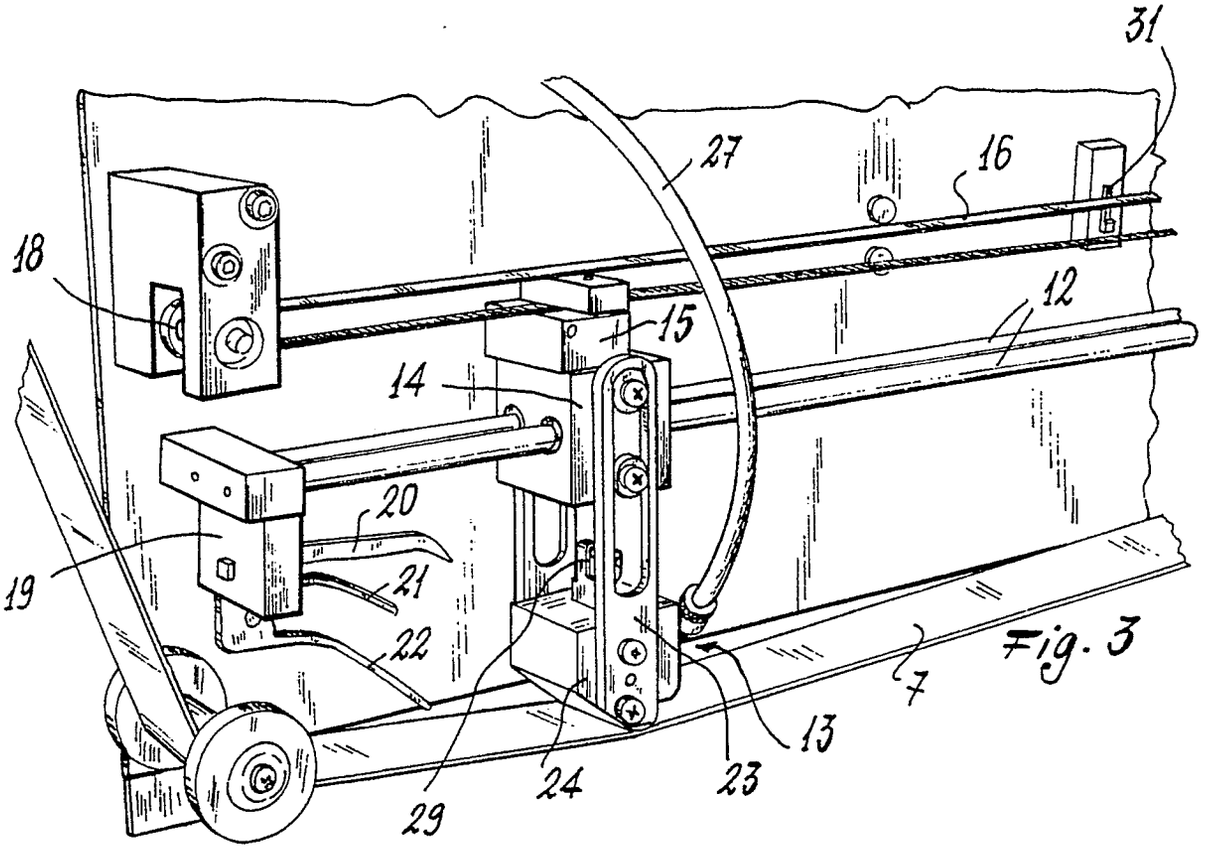

Fig. 3

Fig. 5

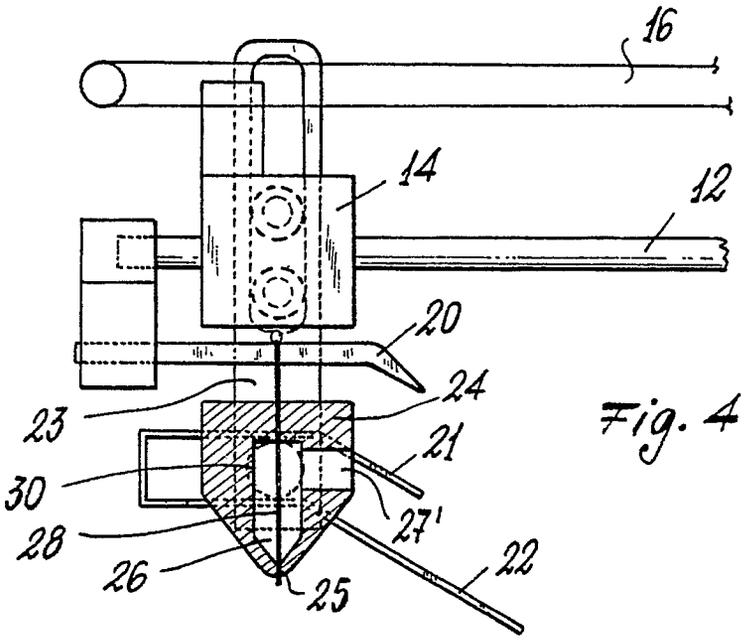

Fig. 4