Title: AN AUTOMATIC DEVICE FOR DISPENSING AND APPLYING ADHESIVE TAPE IN ROLLS

Abstract: Automatic device for dispensing and applying adhesive tape onto surfaces to be joined, using ordinary adhesive tape of the kind used in offices, schools, workshops, businesses and DIY, etc., comprising a casing (1) supporting a roll (2) of adhesive tape and a cutting blade (3) facing a tail (13) of unwound adhesive tape, characterized in that it comprises mobile application means (4, 5 and 6), controlled by the user, for the direct application under pressure of said adhesive tape onto the surfaces to be joined and that cooperate, during the application and cutting phase of the adhesive tape, with said blade (3) which is movable due to kinematic means (9) for the connection with said mobile application means.
AN AUTOMATIC DEVICE FOR DISPENSING AND APPLYING ADHESIVE TAPE IN ROLLS

The present invention concerns an automatic device for dispensing and applying adhesive tape onto surfaces to be joined, using ordinary adhesive tape of the kind used in offices, schools, workshops, businesses and DIY, etc.

Desk-top dispensers of adhesive tape in rolls are well known, featuring a heavy base for stability, comprising a roll-holder casing and a fixed blade for cutting the tape to the required length.

Similarly, a number of light and portable, non stabilized dispensers are known, these too comprising a roll-holder casing and a fixed cutting blade.

In addition, special adhesive tape dispensers are also known for packaging applications comprising a roll-holder casing, a handle and a fixed cutting blade.

The dispensers with a heavy base have a number of inherent problems: they force the user to move position in order to remove the tape, or alternatively to move the heavy device itself; they are not stable on particularly smooth surfaces and thus can slide towards the user, slip and fall, or otherwise force the user to hold the device with one hand.

The portable dispensers are easier to handle, yet they do not allow, or at least they make it difficult for the user to cut longer pieces of adhesive tape and they force the user to use both hands for the operation.

Both kind of dispensers described above also have a number of defects in common: they force the user to handle the cut tape with its fingers, with the risk of dirtying it, getting it coiled up or sticking to itself or sticking it to other paper surfaces by mistake, thus ruining the tape; they force the user to use both hands to apply longer pieces of tape,
with the risk, due to static electricity, of attracting the sheets of paper to
be joined and thus creating an imperfect joint; they don't allow the
cutting of very short pieces of tape; they force the user to add more
tape if the first piece is cut too short, or vice-versa to cut the tape a
second time if the piece is too long, or to calculate the exact length of
the tape to be cut.

The dispensers of adhesive tape for sealing boxes and for
packaging in general, finally, are not suitable for more precise office
applications: they do not allow to precisely define the starting point for
the application of the tape, as the latter hangs from the dispenser; they
force the user to make wide, strong and firm movements with arm and
wrist to cut the tape, the length of which can in any case not be
determined with precision.

It is the aim of the present invention to eliminate above
mentioned inconveniences.

One particular aim of the present invention consists in allowing
the direct application, using just one hand, of the adhesive tape onto
the surfaces to be joined, starting from a precise point and ending at a
second point in correspondence to which the tape is automatically cut.
without having to remove the dispenser from the surface to which the
tape is being applied.

A further aim of the present invention is the realization of a
device which can be loaded with commonly available rolls of adhesive
tape.

The aims set forth are reached by means of automatic device for
dispensing and applying adhesive tape in rolls according to the present
invention, comprising a casing which holds a roll of adhesive tape, and
a cutting blade facing the tail of the unwound tape, characterized in that
the blade is connected to mobile application means, controlled by the
user, for the direct application under pressure of the adhesive tape
onto the surfaces to be joined, and which cooperate, in the application and cutting phase of the tape, with said blade, mobile on the casing due to a kinematic connection of the latter to said mobile application means.

The advantages offered by the present invention mainly consist in that: the tape does not need to be handled; the tape does not need to be cut to a length longer than the one required; the application of the tape is highly precise; there is no need to use both hands to apply the tape; the device is easy-to-handle, ergonomic, practical and convenient, both in its use and its convenience.

The automatic device for dispensing and applying adhesive tape in rolls according to the present invention will be described more in detail hereinbelow relating to the enclosed drawings in which one embodiment is shown.

Figure 1 shows, in a cross-section of the plane perpendicular to the axis of rotation of the roll of adhesive tape, an automatic device for dispensing and applying adhesive tape in rolls, shown in its resting position.

Figure 2 shows the view of fig 1, with the device in the position it assumes when applying the adhesive tape.

Figure 3 shows, in a partially-exploded perspective view, details of the mobile application and cutting means.

Figure 4 shows, in a perspective view, details of the activation spring in the cutting device.

Figure 5 shows, in a perspective view, details of the position of the application and cutting means during the application of the adhesive tape.

Figures 6 and 7 show, in a perspective view, two alternative realization solutions in the area where pressure is applied to the adhesive tape by the application means.
Figure 8 is a schematic diagram of the movement directions of the application and cutting means at the beginning of the application phase of the adhesive tape.

Figure 9 is a schematic diagram of the sequence of positions of the application and cutting means at the beginning of the application phase of the adhesive tape.

The device according to the present invention mainly consists of:
- a casing 1 holding a roll 2 of adhesive tape;
- a cutting blade 3;
- a control button 4;
- a rocker 5;
- a tightening roller 6.

The casing 1 holding the roll 2 of adhesive tape comprises essentially flat and parallel sides 1a and 1b, connected by a multifunction structure 17.

The roll of adhesive tape 2, of known kind, is rotatably supported in said casing 1 by a roller 7, which is fixed to said sides 1a and 1b.

The cutting blade 3 is rotatably supported in said casing 1 by hinges 8a and 8b, and is connected to a rocker 5 by at least one rod 9.

The control button 4 is rotatably connected to said rocker 5 by means of a pin 10 and can freely slide along a surface 11 of the multifunction structure 17.

Furthermore, the shank of said button 4 may rotate and move around the fulcrum of said structure 17, consisting of its nose 26.

The end 12 of said button 4 in contact with a tail 13 of the adhesive tape is shaped with a convex surface 14, or alternatively, it includes a roller 15 which is rotatibly supported by said end 12.
The rocker 5 comprises two parallel, flat shaped surfaces 5a and 5b, in turn connected by a pin 16, which is rotatingly supported by the sides 1a and 1b of the casing 1.

The tightening roller 6, which also acts as a guide for the tail 13 of the roll 2 of the adhesive tape, is rotatignly supported by the front side of said rocker 5.

The surface of said roller 6, being in contact with the adhesive side of the tape, has grooves or knurls designed for reducing or limiting the tape from sticking to said roller itself.

The rear of the rocker 5 comprises a tooth 18, which alternates between the limit stops of, at one end, a structure 19 fixed to the casing 1 and, at the opposite end, a surface 20 of the structure 17.

Finally, a spring 21 is connected between said structure 17 and the rocker 5. The end of the spring connected to the structure 17 is fastened to a button 22, while the end connected to said rocker 5 is fastened to a button 25 of a structure 23, rotatignly supported by said rocker by means of a pin 24.

Due to said restraints and connections, the working of the automatic dispenser and applicator of adhesive tape according to the present invention may be described as follow.

According to the details shown in figures 1, 2, 8 and 9, in the initial resting position, the tail 13 of the adhesive tape is stretched between the roll 2 and the cutting blade 3, passing above the tightening roller 6.

In this phase, the spring 21 pushes the rear part of the rocker 5 downwards, causing - as a consequence - the raising of the front part of said rocker 5 and of the control button 4.

In this position, said tightening roller 6 is further forward than the end of said blade 3.
To start the application of the adhesive tape on the surfaces to be joined, the device will be positioned so that said cutting blade 3, to which the end of said tail 13 is attached, is placed at the starting point of the section to be joined.

Then, on pressing the control button 4, the shank of said button slides along the surface 11 of the structure 17, causing the lowering of the front part of said rocker 5, and the consequence raising of its rear part until the tooth 18 gets into contact with the surface 20, causing the compression of the spring 21 and the rotation and raising of the cutting blade 3.

The lowering of the front part of said rocker 5 also causes the tightening roller 6 to move backwards inside the casing 1 with respect to said blade 3.

The trajectories of the movements of the end 12 of the button 4 and of the cutting blade 3 are shown with dashed lines and arrows in fig. 8, while the four typical positions assumed during the various phases by these components, as well as by the tightening roller 6 and by the end of the tail 13 of the adhesive tape, are shown in fig. 9.

With particular reference to the latter figure, during the lowering of the button 4 and the raising of the blade 3, the adhesive tape resting on the tightening roller 6 is removed from said blade and made to stick to the surfaces to be joined by the end 12, which applies a pressure on the tape itself by means of the convex surface 14 or by the rotating roller 15, making the end of the tail of the adhesive tape rest against the internal surface of the blade 3 and slide downwards until the cutting teeth, before leaving the device to the front of the blade and sticking to the surfaces to be joined.

When the adhesive tape has been applied up to the end of the required section, the button 4 is pulled towards the multifunction structure 17. The shank of said button 4 pushes against said structure
17 in the fulcrum consisting of the nose 26 and slides along the surface 11.

This movement causes the opposite movement of the previously described parts and the cutting of the adhesive tape due to the rotation of the blade 3 and the moving forwards of the tightening roller 6 with respect to the end of said blade. The final clicking into place of said cutting blade 3 is favoured by the spring 21, which acts on the rear of the rocker 5, until said rocker stops against the fixed structure 19.
CLAIMS

1. An automatic device for dispensing and applying adhesive tape in rolls, comprising a casing (1) supporting a roll (2) of adhesive tape and a cutting blade (3) facing a tail (13) of unwound adhesive tape, characterized in that it comprises mobile application means controlled by the user, for the direct application under pressure of said adhesive tape onto the surfaces to be joied and that cooperate, during the application and cutting phase of the adhesive tape, with said blade (3) which is movable due to kinematic means for the connection with said mobile application means.

2. A device according to claim 1, characterized in that said mobile application means controlled by the user comprise a button (4), a rocker (5) and a tightening roller (6).

3. A device according to claims 1 and 2, characterized in that said rocker (5), connected to said button (4), is rotatively restrained onto said casing (1) in opposition to elastic means (21).

4. A device according to claim 3, characterized in that said elastic means (21) are provided between a multifunction structure (17) linked to said casing (1) and a structure (23) rotatively supported by said rocker (5).

5. A device according to claim 1, characterized in that said kinematic means for connecting said blade (3) with said mobile application means comprise at least one rod (9).

6. A device according to claim 2, characterized in that said button (4) comprises an end (12) which, in use, gets into contact with said tail
(13) of the adhesive tape, shaped with a convex surface, or in an alternative, comprises a small roller (15) rotatantly supported by said end.

7. A device according to claim 2, characterized in that said tightening roller (6) is rotatantly supported in the front part of said rocker (5), as it acts as a guide for said tail (13) of said adhesive tape roll (2), and cooperates with said blade (3) during the cutting phase, surpassing the same.

8. A device according to claim 7, characterized in that the surface of said roller (6) comprises grooves or knurles for reducing the adhesion of the tape on said roller.

9. A device according to claim 3, characterized in that the back part of said rocker (5) comprises a tooth (18) that cooperated in opposition relationship alternatively with a structure (19) fixed onto said casing (1) and, on the other side, with a surface (20) of said structure (17).
# INTERNATIONAL SEARCH REPORT

## A. CLASSIFICATION OF SUBJECT MATTER

**IPC 7** B65H35/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

**IPC 7** B65H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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document member of the same patent family

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Name and mailing address of the ISA:

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