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(54) Method for making books from a pack of signatures sewn together

(57) A method for making books from a pack (3) of signatures (4) sewn together, with the sewing thread (f) interrupted after each group (5) of signatures (4) that make up a book, includes the step of applying to each group (5) of signatures (4) at least one length (13) of adhesive tape embracing the signatures (4) of the group (5). The method achieves the advantage of ensuring that the last signature (4) of the group (5) cannot be lost, that is to say the advantage of ensuring the integrity and tightness of the complete group (5) containing all its signatures (4), in an unusually simple and reliable manner.

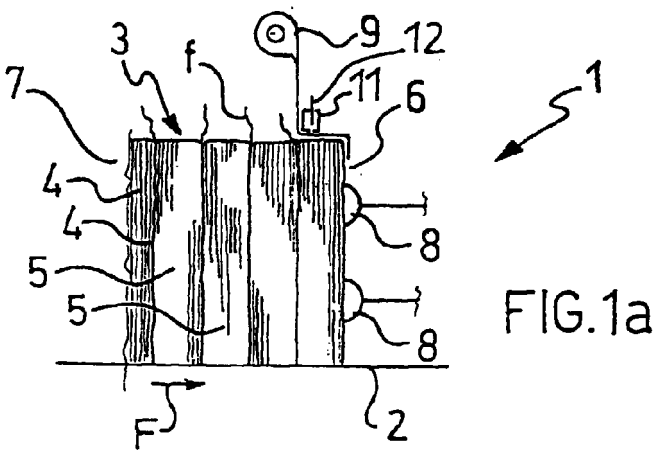

FIG.1a

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Description

[0001] The present invention relates to a method for making books from a pack of signatures sewn together, with the sewing thread interrupted after each group of signatures that make up a book.

[0002] As is known, in the manufacture of books, the signatures are first formed into a pack which is constantly increasing one signature at a time. The signatures of the pack are sewn together on a sewing machine, the sewing being interrupted after each group of signatures having the predetermined number of signatures to make up one book.

[0003] This predetermined number may be small, for example three or four signatures, as happens for example in the case of children's books.

[0004] One group of the pack is removed at a time from the pack to be sent for subsequent processing.

[0005] There is therefore a need to ensure that each group of signatures that make up one book does not lose its integrity and tightness as it moves from the sewing machine to the subsequent processes. In other words the group of signatures must not, for example, lose the last signature en route.

[0006] In order to fulfil this need it is known in the prior art, during sewing, to make a fastening stitch, the purpose of which is to tie off the end of the cut thread and prevent the stitches from coming undone, and therefore to prevent the last signature of the group from becoming detached. This procedure, though extensively used, has the disadvantage of requiring more time. This disadvantage is particularly felt in the case of children's books.

[0007] It has been suggested that a glue be spread on the penultimate signature of the group. The glue ensures that the last signature of the group is bonded to the other signatures of the group. However, this procedure also requires a small amount of extra time and furthermore gives rise to a variety of problems, including the sophistication of the glue distributing assemblies and the difficulty of keeping the sewing machine clean.

[0008] It has also been suggested that the signatures be sewn together with a thread made of an appropriate material that melts at a predetermined temperature, and that this thread be heated when the last signature of the group is sewn, before cutting the thread, so that by melting the thread and bonding it to the signatures the stitch itself is locked. This procedure has the disadvantage that traditional threads can no longer be used and that a special thread needs to be used instead for the sewing operation. It is moreover difficult to fine-tune this procedure, especially as regards control of the thread heating means.

[0009] The problem addressed by the present invention is to devise a method of the type specified, which has characteristics such as to fulfil the need discussed above, while simultaneously overcoming all the disadvantages cited above with reference to the methods of the prior art.

[0010] This problem is solved by a method of the type specified which is characterized in that it includes the step of applying to each group of signatures at least one length of adhesive tape embracing the signatures of the group.

[0011] Other features and the advantages of the method according to the present invention will be apparent from the description given below of an example of its embodiment, with reference to equipment illustrated in the following figures, in which:

- Figure 1a is a schematic view of equipment for implementing a method according to the present invention,
- Figures 1b, 1c and 1d show the equipment of Figure 1a at different operational stages,
- Figure 2a shows a schematic view of equipment for implementing the method according to the invention, in accordance with an alternative embodiment thereof, and
- Figures 2b, 2c and 2d show the equipment of Figure 2a at different operational stages.

[0012] With reference to the accompanying figures, 1 is a general reference for book manufacturing equipment that includes a frame 2.

[0013] On the frame 2 is a pack 3 of signatures 4.

[0014] The signatures 4 of the pack 3 are sewn together, with the sewing thread f interrupted after each group 5 of signatures of a predetermined number that go to make up one book.

[0015] At an exit end 6 of the pack 3 is a group 5 of signatures ready to be sent for subsequent processing.

[0016] Signatures 4 arrive one at a time at the opposite or entrance end 7 of the pack 3, constantly increasing the size of the pack 3, which proceeds through the frame 2 in a direction indicated by the arrow F.

[0017] At the exit end 6 are suction cups 8 forming part of a remover of sewn blocks.

[0018] A dispenser 9 of a continuous adhesive tape 10 is supported by the frame 2 in a position close to the pack 3.

[0019] A bar 11, hollow and running parallel to the spines of the signatures, is supported by the frame 2 and can be moved towards and away from the pack 3, in a stroke A.

[0020] Contained inside the bar 11 is a blade 12 arranged parallel to the bar and capable of moving inside the bar transversely to the latter between a position of retraction inside the bar and a position of extension from the bar, in a stroke indicated by the letter B.

[0021] The numeral 13 indicates a length of adhesive tape produced by cutting the continuous adhesive tape 10.

[0022] This length 13 of adhesive tape has a central section 14 and two ends each bent into an L shape to form two tabs marked 15 and 16. The length 13, which is therefore roughly in the shape of an inverted U,

embraces a group 5 of signatures 4, and is applied to the group 5 of signatures 4 in the manner explained in the rest of the description.

[0023] With reference to the accompanying figures and in particular with reference to an initial condition illustrated in Figure 1a, the operation of the equipment 1 will now be described.

[0024] First of all the suction cups 8 are operated through a predetermined limited stroke marked C, by virtue of which the first group 5 of signatures from the pack 3 is drawn away from the other groups of the pack so that a gap 17 forms upstream of the first group (Figure 1b).

[0025] It should be observed that the width of the gap is approximately equal to the thickness of the bar 11.

[0026] At this point the bar 11 is caused to descend through its stroke A. The bar 11 is active on the continuous tape 10 leaving the dispenser 9 and shapes it into a fold 18 which penetrates in the gap 17 between the first group of signatures and the remaining groups of signatures (Figure 1c).

[0027] The blade 12 is now moved through the stroke B so that it projects from the bar 11 and cuts the continuous adhesive tape 10 at the bottom of the fold 18.

[0028] This completes a length 13 of adhesive tape, which comprises the central section 14 positioned over the spine of the group of signatures and the two tabs 15 and 16 straddling the same group. In this way the length 13 of adhesive tape is stuck to the group of signatures.

[0029] It is important to notice that as a result of the movement of the bar 11, a lateral section of the resulting fold 18 is placed in firm contact with the next group of signatures, thereby initiating the formation of the next length of tape 13 and sticking its tab 15 to the corresponding group of signatures (Figure 1d).

[0030] With the blade 12 retracted and the bar 11 back in its initial position external to the pack, the pack continues to advance along the frame 2 in the direction shown by the arrow F. The continuous adhesive tape 10 is therefore laid over the spine of the group of signatures and the central section 14 of the next length 13 of adhesive tape is formed in consequence. At this point the equipment is back in a condition identical to the initial condition and the cycle is repeated without interruption.

[0031] Referring to Figures 2a, 2b, 2c and 2d, equipment 20 for making books in accordance with a variant of the method of the invention will now be described. In these figures, parts structurally and functionally identical to those of the equipment of Figures 1a, 1b, 1c and 1d are denoted by the same reference numerals and are not described below.

[0032] Referring to an initial condition depicted in Fig. 2a, the bar 11 is moved down, through the stroke A, upstream of the last group of signatures of the pack (Figure 2b). The arrival of at least one signature is awaited, and when it arrives it touches against the bar 11 and therefore against a section of the fold (Figure 2c). The blade 12 is then pushed down (Figure 2d). This forms the length 13 of adhesive tape which embraces the last group of signatures.

[0033] The movement of the pack in the direction of the arrow F following the arrival of further signatures results in the completion of another group of signatures. After this the operation is repeated exactly as from the initial instant. In this variant, the bar and the blade are operated upstream of the last group of signatures of the pack and the blade is operated only when at least the first signature of the next group of signatures to be formed has reached the pack.

[0034] Only one continuous adhesive tape dispenser 9 has been shown in the examples described above. Clearly, though, two or three adhesive tape dispensers may for example be distributed within the length of the spines of the signatures.

[0035] A method for making books, from a pack 3 of signatures 4 sewn together, with the sewing thread f interrupted after each group 5 of signatures 4 that make up a book, includes the step of applying to each group 5 of signatures at least one length 13 of adhesive tape, embracing the signatures 4 of the group 5 and obtained by cutting a continuous adhesive tape 10. The ends of the length 13 of adhesive tape are preferably each folded into an L shape obtained by forming a fold 18 of continuous adhesive tape 10 upstream of one group 5 of signatures 4 of the pack 3.

[0036] It should be observed that the method according to the present invention involves producing the individual lengths 13 of adhesive tape by cutting the continuous adhesive tape 10 in a fold 18 which is formed by inserting a bar 11 between a first group 5 and a second group 5 of signatures 4 of the pack 3.

[0037] In accordance with an alternative embodiment of the method, the individual lengths 13 of adhesive tape are produced by cutting a continuous adhesive tape 10 upstream of the last group 5 of the pack 3.

[0038] The chief advantage of the method according to the present invention is that it ensures that the last signature of the group cannot be lost, i.e. it ensures the integrity and tightness of the group and is at the same time unusually simple and reliable.

[0039] Another advantage of the method according to the present invention is that it is suitable for existing equipment, given modifications that can be carried out on site.

[0040] It should also be observed that, given the simplicity of the method, the service life of the equipment may be expected to be practically indefinite, with no need for maintenance and adjustments.

[0041] Clearly, in order to satisfy particular local requirements, a person skilled in the art will be able to make numerous modifications and alterations to the method and apparatus described above that nevertheless remain within the scope of protection of the invention as defined by the following claims.

Claims

1. Method for making books, from (3) a pack of signatures (4) sewn together, with the sewing thread (f) interrupted after each group (5) of signatures (4) that make up a book, characterized in that it includes the step of applying to each group (5) of signatures (4) at least one length (13) of adhesive tape embracing the signatures (4) of the group (5).

2. Method according to Claim 1, characterized in that it includes the step of cutting a continuous adhesive tape (10) to produce the length (13) of adhesive tape.

3. Method according to Claim 2, characterized in that it includes the step of folding each end of the length (13) of adhesive tape into an L shape.

4. Method according to Claim 3, characterized in that it includes the step of forming a fold (18) of continuous adhesive tape (10) upstream of the group (5) of signatures (4) by means of a bar (11) acting on the continuous adhesive tape (10).

5. Method according to Claim 4, characterized in that the cutting step is performed by a blade (12) mounted movably in the bar (11) and acting on the continuous adhesive tape (10).

6. Method according to Claim 5, characterized in that the step of forming the fold (18) is effected by inserting the bar (11) between a first group (5) of signatures (4) and a second group (5) of signatures (4) of the pack (3).

7. Method according to Claim 5, characterized in that the step of forming the fold (18) is effected by inserting the bar (11) upstream of the last group (5) of signatures (4) of the pack (3).

8. Method according to Claim 7, characterized in that the cutting step is effected after at least the first signature (4) of the next group (5) to be formed has reached the pack (3).

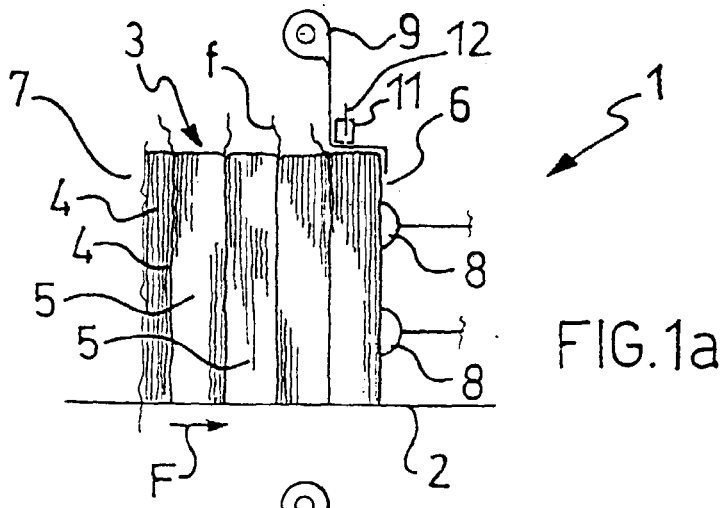

FIG.1a

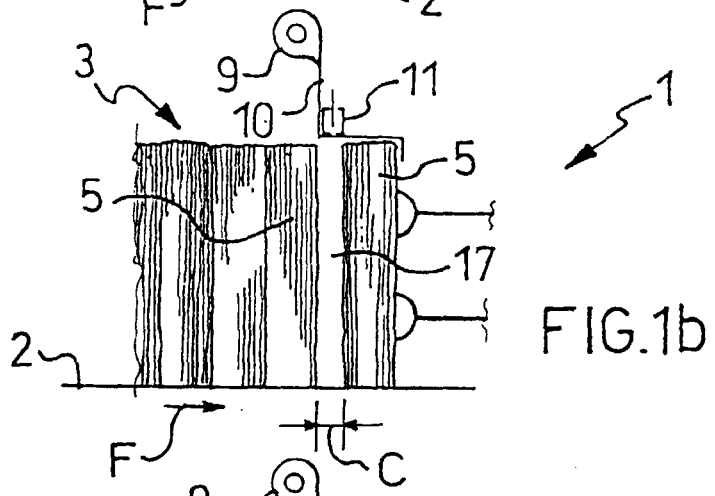

FIG.1b

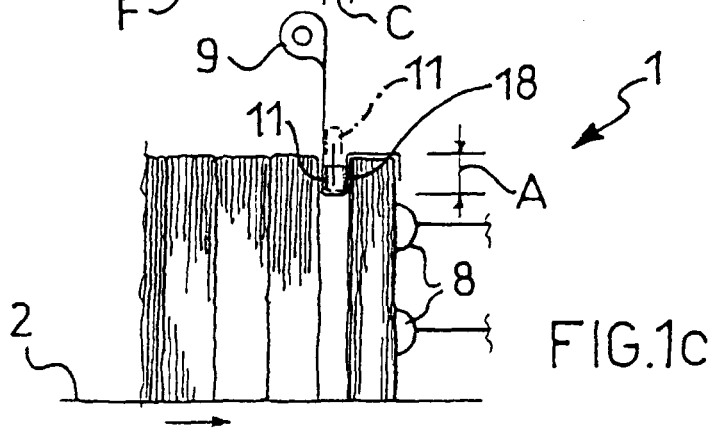

FIG.1c

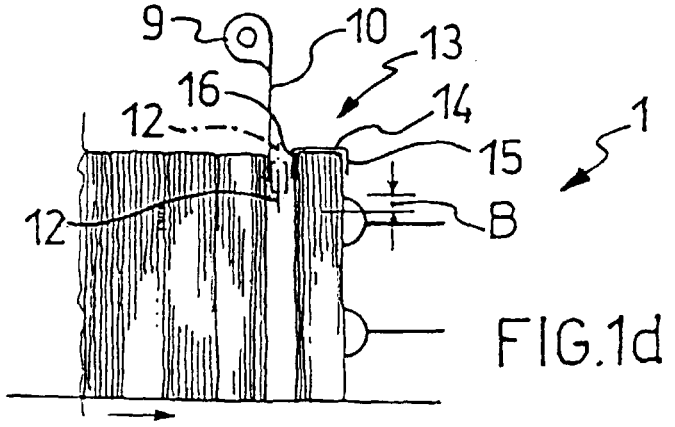

FIG.1d

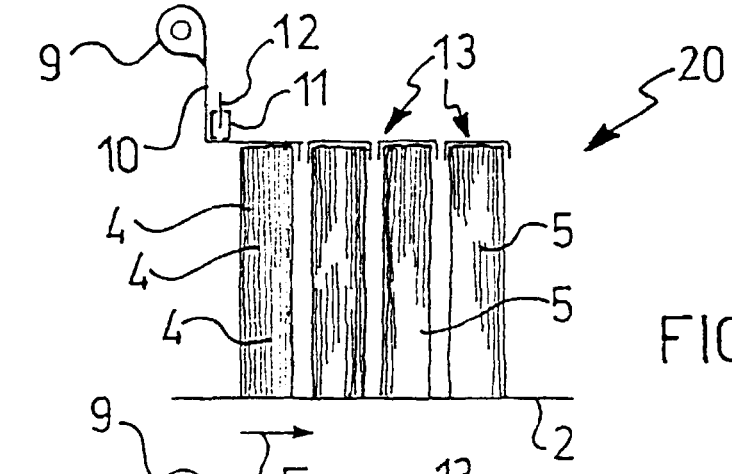

FIG.2a

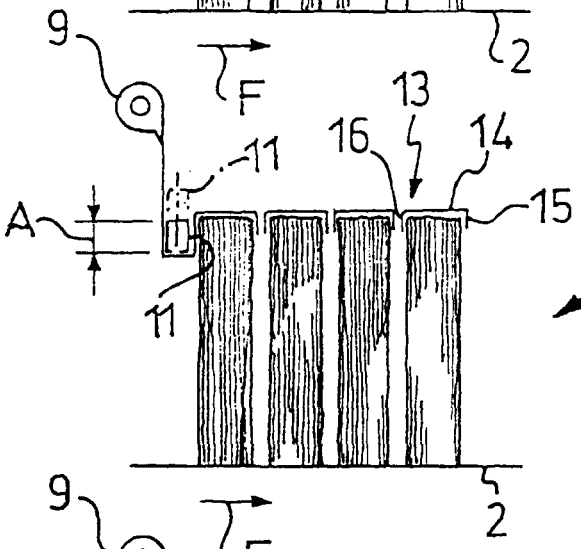

FIG.2b

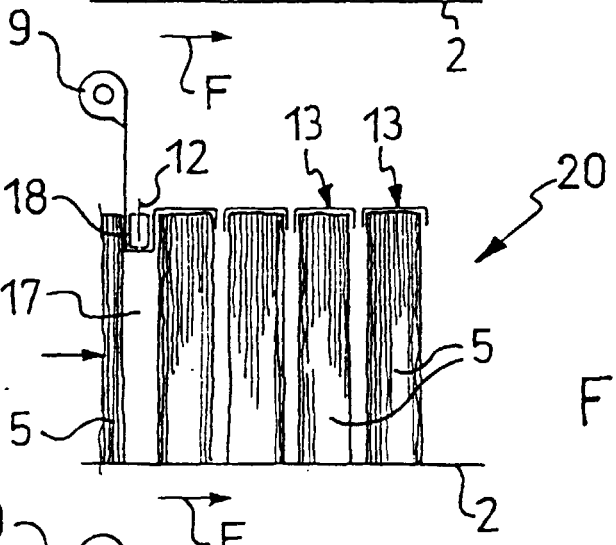

FIG.2c

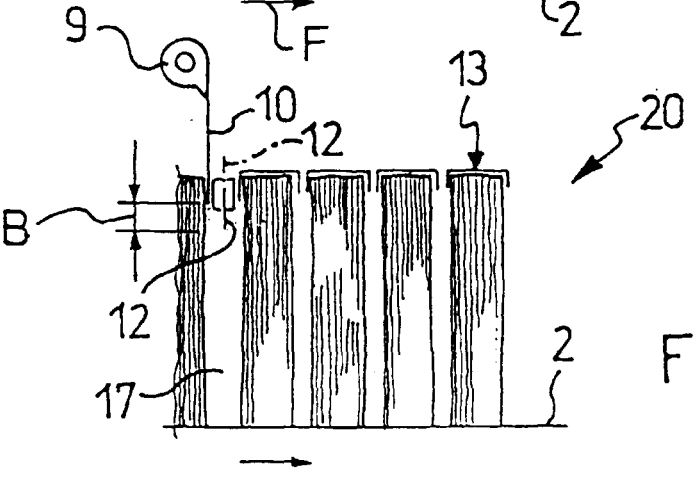

FIG.2d