

14

SPECIFICATION

A method and apparatus for producing book covers or the like

5 This invention relates to a method and apparatus for producing book covers or the like (such as folders or booklets), consisting of a blank with at least one cover and a spine defined by
10 at least one crease line, and a binding agent or material for bonding sheets or pages inserted in the book cover against the inside of said spine.

Book covers, folders and booklets of this
15 general kind are already known. They usually comprise a cardboard or plastics material, which is provided with a spine and two covers joined thereto via two crease lines, said covers enclosing a plurality of sheets or paper. In
20 producing the blank comprising covers and spine, a sheet or roll of material is cut to the desired format, the blank being provided with two crease lines defining the spine. To attach the sheets of paper to the spine, the spine is
25 coated with a bonding agent or binder, subsequent to which the sheets of paper are pushed into the binder, which is then allowed to harden.

Binders of thermosetting type have recently
30 begun to be used to rationalize the manufacture of folders and booklets. Such a binder is in a solid state at room temperature, and is supplied in large sheets or rolls from which strips are cut. A strip is attached to the inside
35 of the spine by placing it between the crease lines and thereafter heating it so that the binder melts and adheres to the inside of the spine. When the binder has hardened, the book covers are taken to a binding machine
40 together with the pages which are to be enclosed between the covers, with the edges of the sheets in contact with the strip attached to the inside of the spine. The strip is heated by the machine, the edges of the sheets being
45 surrounded by viscous binder. After cooling the sheets are rigidly attached to the spine.

The above-described method of manufacturing folders or booklets is comparatively effective, but necessitates a plurality of work operations. Furthermore, during the manufacturing
50 process it is difficult to orient the strip exactly on the inside of the spine between the crease line, which is necessary if all the sheets along the whole of their length are to make contact
55 with the strip and adhere firmly thereto, and if the crease lines are to be kept free from binder and the covers are to be bent as intended, without any obstruction.

It is a particular although not exclusive
60 object of the present invention to provide a method and apparatus of the kind described in the introductory paragraph, by the aid of which the above-mentioned disadvantages of previously known methods and apparatus are
65 mitigated.

According to one aspect of the present invention there is provided a method of producing a book cover or the like, comprising the steps of positioning a strip of binding
70 material on a base, relative to a creasing means, aligning a blank in a predetermined position relative to the base and creasing means, and pressing together the blank, creasing means and strip, thereby to form at
75 least one crease line on the cover to define a spine thereof, and attach the strip to the inside of the spine.

According to another aspect of the present invention, there is provided apparatus for producing book covers or the like having at least
80 one cover, a spine defined by at least one crease line, and a binding material in the spine, the apparatus comprising a creasing means, a base for supporting and positioning
85 a strip of binding material relative to said creasing means, and pressing means for pressing together a blank, a strip of binding material on the base and said creasing means, to form the or each crease line on the blank
90 and attach the strip to the inside of the spine thereby defined.

For a better understanding of the invention and to show how the same may be carried into effect, reference will now be made, by
95 way of example, to the accompanying drawings, in which:

Figure 1 is a perspective view of a folder produced by a method in accordance with the invention, seen from the inside and in a
100 folded-out, flat condition;

Figure 2 is a perspective view of an apparatus for carrying out the method;

Figure 3 is a side view, partially in section, of a portion of the apparatus illustrated in *Fig. 2*; and
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Figures 4 and 5 are side views, partially in section, of two further embodiments of apparatus in accordance with the invention.

The folder illustrated in *Fig. 1* and manufactured in accordance with the inventive method
110 comprises a cardboard blank with two covers 1 and 2 and a spine 3, which is connected to the covers via crease lines 4 and 5 extending over the whole height of the folder. On the
115 inside of the spine 3 there is attached a binding material in the form of a glue strip 6 in a solid condition. When pages (not shown) are to be fixed in the folder, the sides 1 and 2 are folded upwardly along the crease lines 4
120 and 5 so that they become substantially mutually parallel, and the pages are inserted between the sides 1 and 2 so that longitudinal edges thereof rest against the strips 6. The folders and pages are then inserted in a
125 binding machine (not shown) known *per se*, where the strip 6 is heated so that the pages penetrate the viscous outer layer of the strip. After the strip 6 has cooled, the pages are firmly connected to the spine 3 of the folder.
130 A flat cardboard blank 7 is indicated by

chain-dotted lines in Fig. 2, and the blank is to be provided with crease lines 4, 5 and strip 6. The blank 7 is aligned by displaceable rails 8 into a correct position in a horizontal plane.

- 5 A bottom plate consisting of two parts 9 and 10 support the outer parts of the blank 7. Creasing means in the form of metal strips 11 and 12 are attached to the mutually opposing side edges of the parts 9, 10, said strips 11, 12 supporting the central portion of the blank 7 and being somewhat longer than the height of the blank. A plate 13 is mounted between the strips 11 and 12, and forms a base for the strip 6. The width of the strip 6 is only slightly smaller than the distance between the strips 11 and 12, and the strip 6 can therefore not be displaced relative thereto. The thickness of the strip 6 is preferably somewhat less than the distance between the upper surface of the plate 13 and the upper edges of the strip 11, 12.

- After the strip 6 and blank 7 have been placed in their positions illustrated in Figs. 1 and 2, a reciprocally movable press means 14 situated above the plates 9, 10, 13 is displaced towards them. The underside of the press means 14 is provided with a plate 15 of resilient material, e.g. silicon rubber, which is deformed when it is pressed against the strips 11 and 12 under comparatively high pressure, and thereby providing the depressions in the form of crease lines 4, 5 in the blank 7 between the strips and plate 15, so that the blank is separated into covers 1, 2 and spine 3. Instead of making the plate 15 from resilient material, it can consist of metal, although co-operating elongate recesses situated above the strips 11, 12 and which can accommodate said strips must be made in the plate.

- When plate 15 of the press means is pressed against the strips 11, 12, the portion of it between the strips comes into contact with the strip 6, simultaneously pressing it against the plate 13. Above the plate 15 in the press means 14 there is a heating element 16 which heats the strip 6 during the pressing operation so that it becomes viscous, whereat its upper surface adheres to the spine 3. If the strip 6 is provided on its upper surface with a self-adhesive material, heating is not required. In this case, the strip 6 adheres to the spine as soon as the spine 3 is pressed into engagement against the upper surface of the strip.

- In order that the apparatus shown in Figs. 1 and 2 can be suited to the manufacture of different-sized folders with spines 3 of different widths, the plate 13 can be exchanged for plates of other width.

- A modification of the apparatus according to Figs. 2 and 3 is shown in Fig. 4. The press means 14, strips 11 and 12 and bottom plate 10 are identical with corresponding details in Fig. 3. The bottom plate 9 is, however, provided with a slit 17 through which the forward

portion of a roll or sheet 19 of binder is insertable. After the edge of the forward portion has been taken into engagement against the side wall of the plate 10, a punch 18,

- 70 with a width which is slightly less than the distance between the strips 11 and 12 and with a length approximately corresponding to that of the strips, is taken upwards from the position shown in Fig. 4, its sharp upper left edge 18a cutting the forward edge of the material 19 against the underside of the strip 11 so that the strip 6', corresponding to the strip 6, is formed. The strip 6' is taken further upwards by the punch 18, on the upper surface of which it rests, into the position shown by dashed lines in Fig. 4. In this position the upper flat surface of the punch 18 serves as a solid base corresponding to the plate 13 (in Figs. 2 and 3) for the strip 6', and is kept in this position during the action of the press means 14. After the strip 6' has adhered to the blank 7, the punch is returned to its lower position shown in Fig. 4, whereafter the forward edge of the roll or sheet of material 19 is once again urged towards the side wall of the plate 10.

- The apparatus illustrated in Fig. 4 can also be used for attaching the strip 6' to the spine 3 of a blank 7, which has already been provided with the crease lines 4, 5 during a previous work operation. The blank 7 with crease lines 4, 5 is in this case aligned in the same way as previously described, so that the upwardly convex crease lines rest on the upper edges of the strips 11, 12. The punch 18 is then moved upwards, whereat it cuts off the strip 6' from the roll or sheet 19 and takes the strip into engagement against the inside of the spine 3. The punch 18 is retained in this position and thus forms a base for the strip when the press means 14 subsequently presses the strip against the outside of the spine. Instead of allowing the press means 14 to press the spine 3 downwards while the punch 18 assumes the position shown by dashed lines in Fig. 4, the press means can, after the blank 7 has been placed in the position illustrated in the Figure, be taken downwards into engagement against the blank and be retained in this position, whereafter the punch presses the strip 6' upwards into engagement with the spine. Aspects of Fig. 4 are claimed in our co-pending divided-out patent application 813575, Serial No 2085361.

- Another embodiment of the creasing means, press means and base for the strip 6 is illustrated in Fig. 5. Here the creasing means comprises two light annular projections 21 and 22 on a roller 20, the base for the strip 6 comprising the circumference of the roller between the projections. The press means comprises a roller 23 provided with two grooves 24, 25 around the whole of the circumference of the roller 23 and spaced

16

from each other in correspondence with the spacing between the projections 21 and 22. The projections 21 and 22 of the roller 20 partly project into the grooves 24 and 25 of the roller 23. When the crease lines 4 and 5 on the blank 7 are to be formed, and the strip 6 is to be adhered to the spine 3 of the blank, the strip 6 and blank 7 are substantially simultaneously inserted in the nip between the rollers 20 and 23 while these are rotated in opposite angular directions, the projections 21, 22 and grooves 24, 25 successively form the crease lines, while the surface of the roller between the grooves 24 and 25 press the strip 6 towards the surface between the projections 21 and 22 on the roller 20, the strip thus successively being adhered to the spine 3. For attaching the strip 6 to the spine 3, the upper surface of the strip can be provided with a self-adhesive material layer, or a heating element 26 can be arranged in the roller 23. Instead of the grooves 24 and 25, the roller can be provided with a resilient surface layer, the function of which corresponds to that of the plate 15 in Figs. 2-4.

An important advantage of the illustrated embodiment is that the strip consisting of the binder may be adhered to the spine of the folder during the same work operation as the crease lines between spine and covers are formed, and that the strip is thereby exactly oriented between the crease lines formed. When the strip is cut from a sheet or roll of material during the same work operation as the strip is taken into engagement against the inside of the spine, which has been provided with crease lines, one work operation is thus dispensed with.

It should be understood that the invention is not limited to the embodiments described above and illustrated in the drawings. Thus, the crease lines 4 and 5 do not need to be continuous, for example, but can consist of weak regions of different lengths and at different distances from each other. It is also possible to provide several parallel crease lines outside the crease lines 4, 5 if such should be found desirable. The method is also applicable to the manufacture of book covers, folders, booklets and the like with only one proper cover.

CLAIMS

1. A method of producing a book cover or the like comprising the steps of positioning a strip of binding material on a base, relative to a creasing means, aligning a blank in a predetermined position relative to the base and creasing means, and pressing together the blank, creasing means and strip, thereby to form at least one crease line on the cover to define a spine thereof, and attach the strip to the inside of the spine.

2. A method according to claim 1, wherein said creasing means comprises two

projections forming two crease lines between which the strip is attached.

3. A method according to claim 1 or 2, wherein the strip is heated whilst the blank, creasing means and strip are being pressed together.

4. A method according to claim 1, 2 or 3, wherein the strip is cut from a roll or sheet of binding material by a cutting means which affords said base.

5. A method according to any preceding claim, wherein the width of the strip corresponds substantially to the width of the spine.

6. Apparatus for producing book covers or the like having at least one cover, a spine defined by at least one crease line, and a binding material in the spine, the apparatus comprising a creasing means, a base for supporting and positioning a strip of binding material relative to said creasing means, and pressing means for pressing together a blank, a strip of binding material on the base and said creasing means, to form the or each crease line and attach the strip to the inside of the spine thereby defined.

7. Apparatus according to claim 6, including aligning means for aligning a blank relative to the base and creasing means.

8. Apparatus according to claim 6 or 7, wherein said creasing means comprises two projections for forming two crease lines between which a spine is defined.

9. Apparatus according to claim 6, 7 or 8, including heating means for heating a strip of binding material whilst it is being pressed together with a blank.

10. Apparatus according to claim 9, wherein said heating means is incorporated in said pressing means.

11. Apparatus according to any of claims 6 to 10, wherein the base is adapted to be exchangeable with one of different width, to accommodate different widths of strips of binding material.

12. Apparatus according to any one of claims 6 to 11, including a cutting means for cutting a strip of binding material from a roll or sheet thereof, the cutting means comprising a cutting edge and said base, which is displaceable from a first position, where a portion of such a roll or sheet may be placed thereon, to a second position where it co-operates with said cutting edge to cut off a strip from the roll or sheet.

13. Apparatus according to claim 12, wherein the base is further displaceable from said second position to a third position where it is operable with said pressing means.

14. Apparatus according to any one of claims 6 to 13, wherein the pressing means comprises a pressure plate formed on one face with a resilient material or at least one depression to cooperate with the creasing means.

15. Apparatus according to claim 8 or



from each other in correspondence with the spacing between the projections 21 and 22. The projections 21 and 22 of the roller 20 partly project into the grooves 24 and 25 of the roller 23. When the crease lines 4 and 5 on the blank 7 are to be formed, and the strip 6 is to be adhered to the spine 3 of the blank, the strip 6 and blank 7 are substantially simultaneously inserted in the nip between the rollers 20 and 23 while these are rotated in opposite angular directions, the projections 21, 22 and grooves 24, 25 successively form the crease lines, while the surface of the roller between the grooves 24 and 25 press the strip 6 towards the surface between the projections 21 and 22 on the roller 20, the strip thus successively being adhered to the spine 3. For attaching the strip 6 to the spine 3, the upper surface of the strip can be provided with a self-adhesive material layer, or a heating element 26 can be arranged in the roller 23. Instead of the grooves 24 and 25, the roller can be provided with a resilient surface layer, the function of which corresponds to that of the plate 15 in Figs. 2-4.

An important advantage of the illustrated embodiment is that the strip consisting of the binder may be adhered to the spine of the folder during the same work operation as the crease lines between spine and covers are formed, and that the strip is thereby exactly oriented between the crease lines formed. When the strip is cut from a sheet or roll of material during the same work operation as the strip is taken into engagement against the inside of the spine, which has been provided with crease lines, one work operation is thus dispensed with.

It should be understood that the invention is not limited to the embodiments described above and illustrated in the drawings. Thus, the crease lines 4 and 5 do not need to be continuous, for example, but can consist of weak regions of different lengths and at different distances from each other. It is also possible to provide several parallel crease lines outside the crease lines 4, 5 if such should be found desirable. The method is also applicable to the manufacture of book covers, folders, booklets and the like with only one proper cover.

CLAIMS

1. A method of producing a book cover or the like comprising the steps of positioning a strip of binding material on a base, relative to a creasing means, aligning a blank in a predetermined position relative to the base and creasing means, and pressing together the blank, creasing means and strip, thereby to form at least one crease line on the cover to define a spine thereof, and attach the strip to the inside of the spine.

2. A method according to claim 1, wherein said creasing means comprises two

projections forming two crease lines between which the strip is attached.

3. A method according to claim 1 or 2, wherein the strip is heated whilst the blank, creasing means and strip are being pressed together.

4. A method according to claim 1, 2 or 3, wherein the strip is cut from a roll or sheet of binding material by a cutting means which affords said base.

5. A method according to any preceding claim, wherein the width of the strip corresponds substantially to the width of the spine.

6. Apparatus for producing book covers or the like having at least one cover, a spine defined by at least one crease line, and a binding material in the spine, the apparatus comprising a creasing means, a base for supporting and positioning a strip of binding material relative to said creasing means, and pressing means for pressing together a blank, a strip of binding material on the base and said creasing means, to form the or each crease line and attach the strip to the inside of the spine thereby defined.

7. Apparatus according to claim 6, including aligning means for aligning a blank relative to the base and creasing means.

8. Apparatus according to claim 6 or 7, wherein said creasing means comprises two projections for forming two crease lines between which a spine is defined.

9. Apparatus according to claim 6, 7 or 8, including heating means for heating a strip of binding material whilst it is being pressed together with a blank.

10. Apparatus according to claim 9, wherein said heating means is incorporated in said pressing means.

11. Apparatus according to any of claims 6 to 10, wherein the base is adapted to be exchangeable with one of different width, to accommodate different widths of strips of binding material.

12. Apparatus according to any one of claims 6 to 11, including a cutting means for cutting a strip of binding material from a roll or sheet thereof, the cutting means comprising a cutting edge and said base, which is displaceable from a first position, where a portion of such a roll or sheet may be placed thereon, to a second position where it cooperates with said cutting edge to cut off a strip from the roll or sheet.

13. Apparatus according to claim 12, wherein the base is further displaceable from said second position to a third position where it is operable with said pressing means.

14. Apparatus according to any one of claims 6 to 13, wherein the pressing means comprises a pressure plate formed on one face with a resilient material or at least one depression to cooperate with the creasing means.

15. Apparatus according to claim 8 or



- claim 9 or 10 as appendant thereto, comprising a first roller which is formed with two annular projections as said creasing means, between which said base is defined, and a
- 5 second roller having a resilient surface or two annular grooves to cooperate with said annular projections, the pressing means being arranged to press the two rollers together with a blank and a strip of binding material in the
- 10 nip thereof.
16. Apparatus according to claim 15, including drive means for rotating the rollers to feed a blank and strip of binding material therethrough.
- 15 17. A method of producing a book cover or the like, the method being substantially as hereinbefore described with reference to Fig. 1, Figs. 2 and 3, or Fig. 5, of the accompanying drawings.
- 20 18. Apparatus for producing a book cover or the like, the apparatus being substantially as hereinbefore described with reference to Fig. 1, Figs. 2 and 3, or Fig. 5, of the accompanying drawings.
- 25 19. A method of producing a book, comprising binding pages to the binding material of a book cover produced by a method according to any of claims 1 to 5 and 17.