Dec. 14, 1965 F. BERTSCH 3,223,437

ENDLESS BLANK FORMS

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Fig. 1

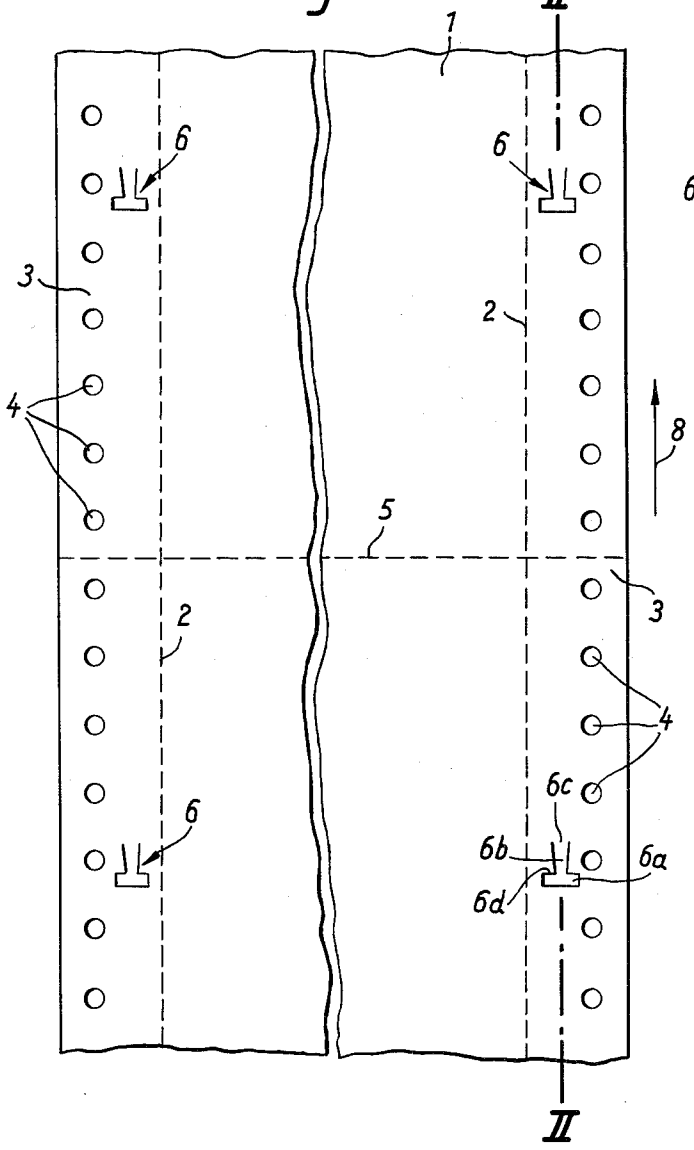
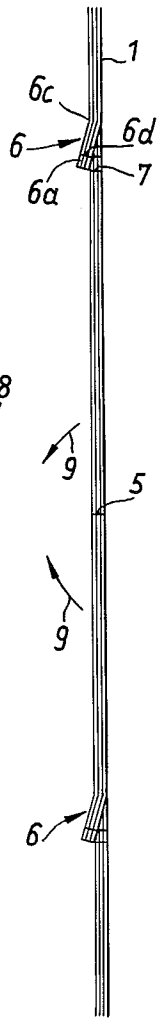


Fig. 2



INVENTOR.
Fritz Bertsch

BY Michael S. Striker
his attorney

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ENDLESS BLANK FORMS

Fritz Bertsch, Neuffen, Wurttemberg, Germany, assignor to Messrs. Hans Biel, Neuffen, Wurttemberg, Germany

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In the manufacture of endless blank forms, several writing paper webs as well as webs of a copying paper, e.g., a carbon paper, which have on at least one longitudinal side a marginal strip with holes provided at regular intervals for guiding the webs by means of pin rollers or pin chains, are carried together. The individual webs must be joined together in the marginal zones. For this purpose many different methods have been used. Heterogeneous paper connectors such as wire clamps, etc., are known but constitute a hazard for the modern rapidly working accounting, punched card and tabulating machines with their complex, partly electronically controlled mechanisms.

To avoid these disadvantages joining the webs by means of adhesives has been effected. This is relatively expensive, especially as regards to adhesive equipment. Moreover, although the gluing leads to success in the case of single sets, in the case of endless sheets, which as is known are made in a zigzag stack, considerable difficulties occur.

If the glue has set before the folding, a satisfactory zigzag stack cannot be formed. When the fold is on the perforation, the outer paper web tends to tear. The inner paper web, which has to be shorter, usually forms a double fold. Both lead to trouble during the use of the endless sheets in office machines. If the glue has not set up to the folding, folding of the paper webs causes the same to be moved relative to one another so that the print of the individual paper webs is no longer exactly superimposed. In addition, the paper web on the outside of the fold, on withdrawal from the pile, forms a roof-shaped elevation above the fold.

As a general principle, the webs on folding and on taking off should be moved to a certain degree relative to one another in the direction of motion, but not in the transverse direction. During the further treatment when the stack is drawn into the office machine, the paper webs should again return to their old exact position.

Known fastenings, in which the superimposed paper webs are held together on their marginal strips by punched out and by them pressed through tongues, largely correspond to this requirement. A disadvantage is, however, that the paper webs are easily detached from one another.

The invention consists in a kind of tongue fastening such that the side edges of the tongues extending in the longitudinal direction of the paper web have projecting and re-entering sections so that a keying is formed between the laterally projecting edges of the tongue and the corresponding edges of the punched opening. Preferably the tongues are so arranged that the foot ends of the tongues remaining connected to the paper web lie in front in the direction of motion through the office machine.

The punching out of the tongues may be effected in a travelling paper web by rotating tools or in stationary paper webs by tools moved in a straight line. At least one punched out part should be in each separate blank.

The punched out tongues are pressed through the paper web so far that their free end arrives below the lower paper web. The tongues only go back into their starting position with difficulty, since the projecting sections of the side edges of the tongues spread out against the appropriate marginal sections of the punched opening. The connection is sufficiently flexible for the paper webs on folding and zig-zag withdrawal to be able to move somewhat relative to one another in the longitudinal direction and satisfactory folds to be formed. The tongues thereby move in the punched out openings so that the locking ensuring against detachment is further strengthened. When on drawing into the office machine, the paper webs are again folded back into a plane, the movement of the paper webs is reversed with the result that the paper webs again lie exactly above one another. A mutual movement of the paper webs in the transverse direction is excluded, since in this direction the relatively narrow tongues completely fill the punched opening.

In a preferred embodiment of the invention the tongues are T-shaped and the foot end remaining connected with the paper web suitably lies in front in the direction of motion through the office machine. This embodiment is especially effective because the locking lateral projections of the tongues run at right angles to the longitudinal direction of the paper web and therefore exert locking forces exclusively in this direction.

An example of the last-named embodiment is shown in the drawing.

FIG. 1 shows a plan view of a portion of the attached paper webs extending on both sides of a fold perforation.

FIG. 2 shows a section along line II—II of FIG. 1.

The paper webs denoted by **1** have lateral guiding strips **3** limited by longitudianl perforations **2** in which holes **4** for guiding in the office machine by means of pin rollers or pin chains are provided in the longitudinal direction of the paper web at equal intervals.

The separate blanks are divided by transverse perforations **5**, at which the paper webs accurately covering each other with respect to their guiding holes and their printing are folded, in order to take them off subsequently in a zig-zag pile.

To join the paper webs, tongues **6** are punched out from them at equal distances inside the lateral guiding strips **3**, either between the guiding holes **4** or laterally beside these. In the embodiment of the example these tongues are T-shaped, the transverse arm **6*a*** lying transversely to the longitudinal direction of the paper web. The end **6*c*** of the longitudinal arm **6*b*** remote from the transverse arm **6** remains connected with the paper web. On punching out the tongues are pressed through the paper webs so far that their transverse arms **6*a*** pass completely through the paper webs (FIG. 2). In this position the edges **6*d*** of the transverse arms **6*a***, running transversely to the longitudinal direction of the paper web and remote from the foot end of the T, spread out against the appropriate edges **7** of the punched opening, so that the tongues can no longer spring back. In the embodiment of the example the width of the longitudinal arm **6*b*** of the T decreases towards the transverse arm **6*a***. Owing to this the locking surfaces **6*d*** are engaged.

The tongues **6** are preferably so arranged that their foot end remaining connected with the paper web lies in front in the direction of motion of the paper webs indicated by arrow **8**. Owing to this the tongues pressed through the paper webs enter the guiding devices of the office machines without resistance. On folding the paper webs, for example in the direction indicated in FIG. 2 by arrows **9**, the paper webs are moved a little relative to one another. The result is that the edges **6*d*** of the superimposed tongues and the appropriate edges **7** of the punched openings are staggered and then lock still more effectively against springing back of the tongues in the plane of the paper web. When on drawing into the office machine, the paper webs are again stretched out flat, the separate paper webs again move relative to one another in the sense that the movement which occurred during folding is cancelled and the paper webs again lie exactly one above the other.

I claim:

1. A continuous composite blank comprising, in combination, a plurality of superimposed working and copying webs, said webs being formed with punched-out tongues spaced in longitudinal direction from each other and each integral at one end thereof with the respective web and bent out of the plane of the web to extend through the complementary aperture formed by the punched-out tongue on the adjacent web to thus fasten the webs to each other, each of said tongues having a longitudinally extending leg integral at one end thereof with the respective web and tapering in width toward its other end, and a pair of abutting portions integral with said other end of said leg and projecting to opposite sides of said leg normal to the elongation thereof, said leg being adapted to extend through said complementary aperture and said abutting portions being adapted to extend upwardly of the web in which said aperture is formed, said abutting portions having respective shoulders adjacent the junction of said abutting portions with said other end of said leg and adapted to engage a circumferential edge portion of an aperture formed in a web other than the web with which said tongue is integral so that, when said webs shift position relative to one another in longitudinal direction of said leg, said shoulders will engage said circumferential edge portion of said aperture and said abutting portions will be drawn against said circumferential edge portion so as to overlie the same and to prevent separation of said webs.

2. A continuous composite blank comprising, in combination, a plurality of superimposed working and copying webs, said webs being formed in lateral edge portions thereof with a plurality of feed holes spaced in longitudinal direction from said webs from each other in which pins are adapted to engage for feeding said blank in one direction, and with punched-out tongues being integral at one end thereof with the respective web and bent out

of the plane of the web to extend through the complementary aperture formed by the punched-out tongue on the adjacent web to thus fasten the webs to each other, each of said tongues having a longitudinally extending leg connected at one end with the respective web and having at its connected end a given width, a transverse arm of a width substantially exceeding said given width and spaced from the connected end so as to form on each tongue a pair of shoulders extending substantially normal to the longitudinal direction of said blank, and an intermediate portion tapering toward said shoulders to a width smaller than said given width, said shoulders being adapted to engage a circumferential edge portion of an aperture in a web other than the web with which said leg is connected and said transverse arm being adapted to overlie said edge portion so that, when said webs move relative to one another, said shoulders will engage said edge portion and said arm will be drawn thereagainst so as to prevent separation of said webs.

3. A continuous composite blank as set forth in claim 2, wherein said transverse arms of said tongues are located in longitudinal direction of said blank between adjacent feed holes.

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EUGENE R. CAPOZIO, *Primary Examiner.*

LAWRENCE CHARLES, JEROME SCHNALL, *Examiners.*