Dec. 4, 1962 H. W. HUFFMAN 3,066,957

FLEXIBLE, MULTIPLE, CONTINUOUS, PULL-APART FORM AND METHOD OF MAKING SAME

Filed Feb. 26, 1960 2 Sheets-Sheet 1

FIG. 1

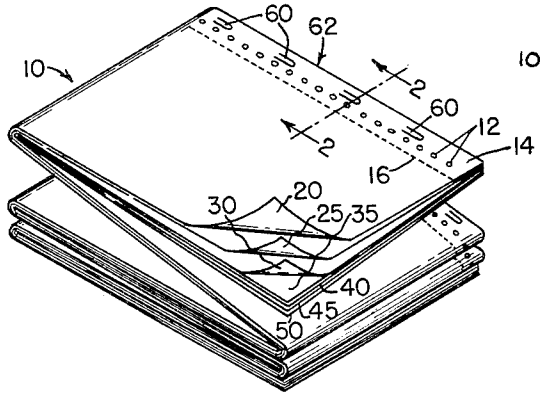


FIG. 10

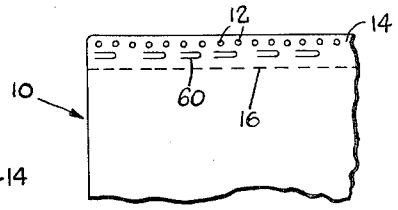


FIG. 2

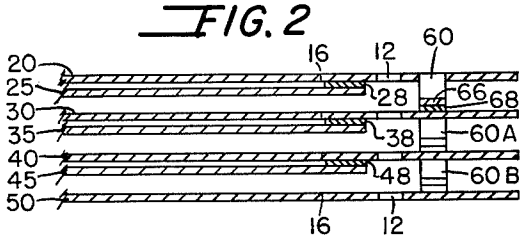
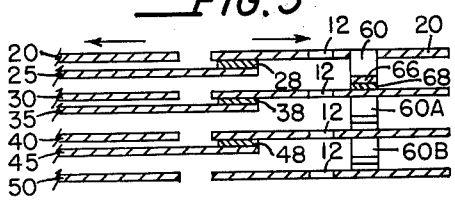


FIG. 3



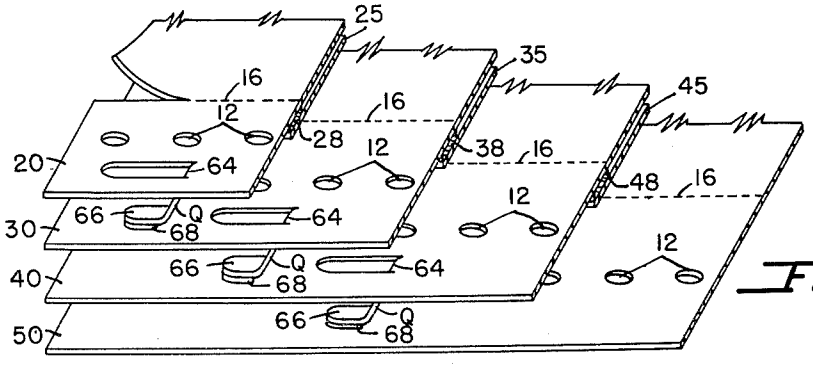


FIG. 4

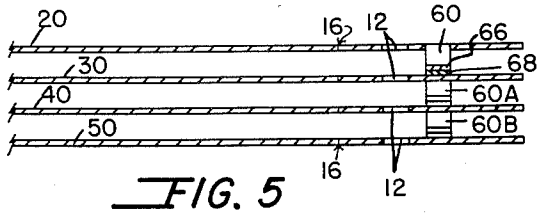


FIG. 5

INVENTOR.
HAROLD W. HUFFMAN
BY J. Warren Kinney, Jr.
ATTORNEY

Dec. 4, 1962 H. W. HUFFMAN 3,066,957

FLEXIBLE, MULTIPLE, CONTINUOUS, PULL-APART FORM AND METHOD OF MAKING SAME

Filed Feb. 26, 1960 2 Sheets-Sheet 2

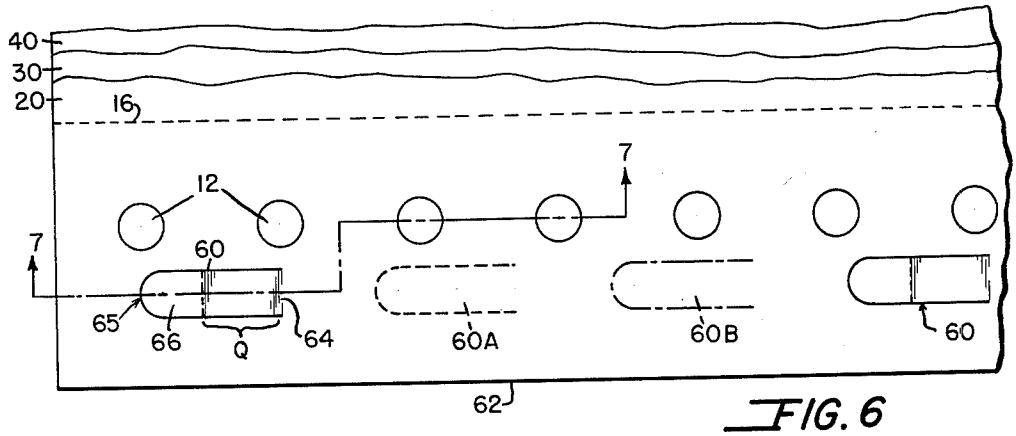


FIG. 6

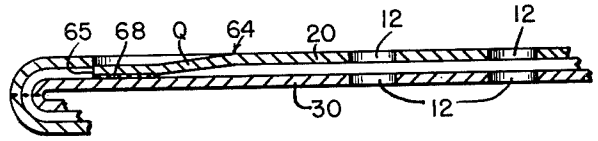


FIG. 7

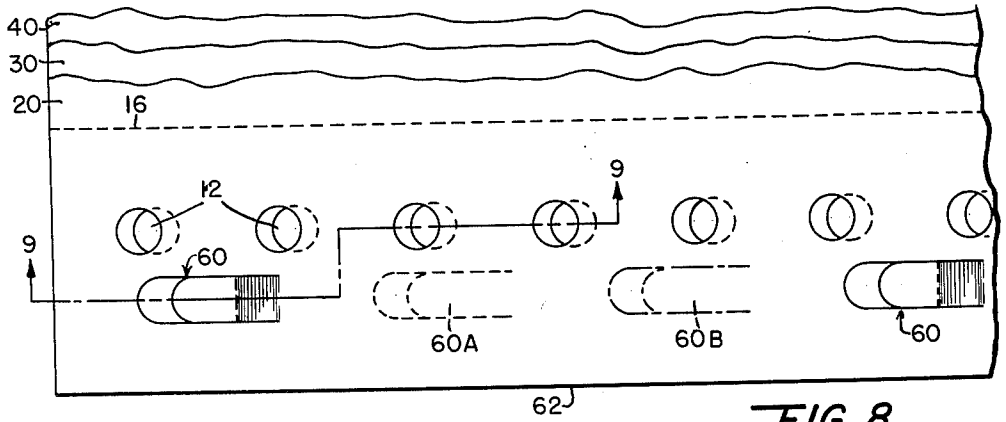


FIG. 8

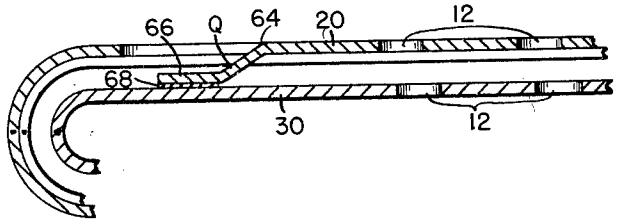


FIG. 9

INVENTOR.
HAROLD W. HUFFMAN
BY J. Warren Kinney, Jr.
ATTORNEY

United States Patent Office

3,066,957

Patented Dec. 4, 1962

3,066,957

FLEXIBLE, MULTIPLE, CONTINUOUS, PULL-APART FORM AND METHOD OF MAKING SAME

Harold W. Huffman, Hamilton, Ohio, assignor to The Hamilton Tool Company, Hamilton, Ohio, a corporation of Ohio

Filed Feb. 26, 1960, Ser. No. 11,268
7 Claims. (Cl. 282—11.5)

This invention relates to business forms, and more particularly to so-called flexible, multiple, continuous pull-apart forms.

An object of the invention is to provide a form containing two or more superposed sheets or strips with means for interconnecting them along a common edge in such a manner that the interconnection will effectively preclude relative motion between the sheets except in one direction.

It is customary in modern bookkeeping techniques to provide business forms in duplicate, triplicate and the like, which business forms are printed and supplied to the user in continuous form, that is, successive sheets are interconnected whereby to provide a continuous form. Such sheets are customarily provided with a series of accurately aligned perforations along an edge thereof to be engaged by suitable registering and feeding mechanisms provided in the business machines with which the forms are to be used. It has also been customary for the printer to stack the continuous business forms in zig-zag fashion in which form they are fed into business machinery for processing. However, when continuous forms are folded in zig-zag fashion the individual sheets tend to move relative to one another. In those instances wherein the superposed sheets are immovably interconnected as by stitching, gluing, or the like, they cannot be successfully or conveniently put up in zig-zag stacks because buckling, distortion and even damage to the interconnected sheets will occur.

It is imperative that the apertures or perforations provided across the sheets be maintained in accurate alignment during those periods of time when a particular set of sheets is being initially interconnected as well as when the sheets of said set are being fed through a business machine even though the apertures or perforations of the sheets of a set are in misalignment when they are stacked in zig-zag fashion.

The prime object of the present invention is to provide a flexible, multiple, continuous business form wherein the successive record sheets or strips which are superposed one upon the other will individually be secured directly to the next lower record sheet in such a manner as to preclude relative movement between the interconnected sheets except in one direction.

A further object of the invention is to provide a business form having the hereinabove described characteristics wherein transfer sheets which are interposed between adjacent record sheets are secured directly to only the upper of said record sheets whereby plain, unprocessed transfer sheets or strips may be utilized.

Another object of the invention is to teach the method of interconnecting adjacent record sheets for limited relative movement.

These and other objects are attained by the means described herein and as disclosed in the accompanying drawings, in which:

FIG. 1 is a perspective view of a flexible, multiple, continuous form embodying the teachings of the present invention, stacked or folded in zig-zag fashion.

FIG. 2 is an enlarged sectional view taken on line 2—2 of FIG. 1, showing the relationship between the various transfer and record sheets or strips.

FIG. 3 is a view similar to FIG. 2 showing the relationship of the various record and transfer sheets incident to severance of a stub from an edge of the record sheets.

FIG. 4 is a fragmentary perspective view, partly in section, illustrating a detail of construction.

FIG. 5 is a view similar to FIG. 2, disclosing a modification of the present invention.

FIG. 6 is a plan view of an edge of an assembly embodying the teachings of the present invention, with the perforations or apertures of the various record sheets of a set in alignment.

FIG. 7 is a sectional view taken on line 7—7 of FIG. 6.

FIG. 8 is a view similar to FIG. 6, showing the relationship of the parts when the apertures or perforations of the sheets of a set are out of alignment, such as occurs when the sheets are stacked in the zig-zag fashion of FIG. 1.

FIG. 9 is a sectional view taken on line 9—9 of FIG. 8.

FIG. 10 is a modified form of the edge of the sheet.

With particular reference now to FIG. 1, the numeral 10 denotes generally a flexible, multiple, continuous business form arranged in zig-zag fashion. As illustrated, the continuous form comprises a plurality of interconnected sets of forms wherein each set includes a plurality of alternate record and transfer sheets or strips.

The numerals 20, 30, 40 and 50 denote four record sheets or strips arranged in nested or superposed position and wherein the upper of each of said sheets is connected directly to the next lower sheet thereof. The numerals 25, 35 and 45 denote generally transfer or carbon sheets each of which is secured as at 28, 38 and 48, respectively, directly to the undersurface of an upper sheet 20, 30 and 40.

It should be understood that the spacing between the various sheets and the thickness thereof have been greatly over-emphasized and exaggerated in FIGS. 2–9 for the purpose of clarity of detail and understanding.

Each of the upper record sheets is provided with a series of axially aligned tongues 60 wherein the direction of axial alignment is parallel with the outer edge 62 of the sheets. As best illustrated in FIG. 6, each of tongues 60 is struck from a record sheet to which it is integrally connected along its rear end as at 64 for providing a tongue having an overall length defined by the distance between the numerals 65 and 64.

The forward or free outer end portion 66 of each tongue is permanently fixed to the upper or adjacent surface of the next lower record sheet, such as by means of a suitable adhesive 68, or the like, whereby the unsecured portion, Q, of the tongue between rear end 64 and the adhesive 68 forms or comprises a flexible link between the adjacent interconnected record sheets 20 and 30.

It should be understood that in actual practice tongues 60 are disposed in the plane of the record strip or sheet from which they are struck during those periods of time when the various record sheets of a set are in alignment, as in FIG. 6. The displacement illustrated in FIG. 7 has been occasioned by reason of the fact that the adjacent record sheets are illustrated quite thick and as being spaced apart, whereas in actual practice the sheets are considerably thinner and their adjacent faces are in abutting relationship.

Adjacent record sheets, thus directly interconnected, are effectively secured together against relative movement except along the axis of said tongues. With reference now to FIGS. 6 and 7, it will be noted that since tongues 60 are fully extended and flat, the upper record sheet 20 cannot be shifted to the right relative to record sheet 30, however it may be shifted to the left relative to sheet 30 by reason of flexible link Q, as in FIGS. 8 and 9. In passing it should be noted and understood that the foregoing type of tongue connection between adjacent record

sheets effectively precludes relative sidewise motion between said sheets at right angles to the axis of said tongues.

By thus flexibly interconnecting the adjacent record sheets, limited relative motion between the individual sheets of a set may occur, such as, by way of example, when a plurality of said sets are stacked in zig-zag fashion.

The numerals 12 denote rows of duplicate apertures or perforations which are provided in each of said record strips between the edge-adjacent edge or locus of the connection of the transfer strips and outer edge 62. These apertures or perforations are adapted to engage suitable feed or registering means commonly found in various types of business equipment of the type with which the subject forms are used. As clearly illustrated in the drawings, the perforations are located in axial alignment between the tongues 60 and the outermost edge of the transfer strips.

A tear line 16 is disposed in each of the record sheets or strips parallel with edge 62 and inwardly of the locus of connection of the various transfer strips to their respective record sheets or strips. Tear lines 16 define a stub 14 which is severable from the record strips 20, 30, 40 and 50, it being noted that said stub includes the perforations 12 and tongues 60 of the various record sheets as well as the transfer sheets 25, 35 and 45.

In FIG. 5 I have illustrated the invention as applied to record sheets without the intervention of separate carbon or transfer strips such as, by way of example, 25, 35 and 45 of FIGS. 2 and 3. The construction of FIG. 5 permits the same limited relative movement between the interconnected sheets as in the construction of FIGS. 2, 3 and 4, and is particularly applicable in those instances when one or both of the adjacent faces of the record sheets are chemically treated to duplicate on the upper surface of each lower sheet whatever is written or impressed on the next higher record sheet or strip.

From the foregoing, it will be noted that in those instances wherein transfer sheets or strips are used it is unnecessary for said sheets to be perforated or provided with tear lines, nor is it necessary that said sheets be secured to but one of the two record strips between which said sheet is disposed. Savings up to 20% are thus effected in addition to the advantages inherent in the novel manner in which the record sheets are interconnected.

In FIGS. 6 and 8 the numerals 60A and 60B denote, respectively, the axially aligned tongues of record sheets 30 and 40, and illustrate the manner in which the tongues of the various interconnected record sheets of a set are disposed in staggered relationship to reduce the overall thickness of a set or form.

It should be understood that the relationship of perforations 12 and tongues 60 may be reversed from the arrangement illustrated in the drawings, that is, the row of perforations may be adjacent the edge of the sheets and the row of tongues 60 disposed inwardly thereof as shown in FIG. 10.

It has been found that the flexible interconnection of the pairs of adjoining record sheets by tongues 60 permits single record sheets to be interposed between pairs of tongue-interconnected sheets, and that the flexible connection of said tongue-connected record sheets permits the objects of the present invention to be accomplished even though single sheets are interposed between and permanently connected to the adjacent sheets of adjoining pairs of tongue-connected sheets.

It should be understood that various changes and modifications may be made within the scope of the appended claims, without departing from the spirit of the invention.

What is claimed is:

1. A continuous, zig-zag folded, multi-sheet business form comprising two or more record sheets, means interconnecting said sheets in sequential pairs with the lower sheet of each preceding pair constituting the upper sheet of the next succeeding pair, said means interconnecting said sheets along a common free side edge for limited relative movement along an axis parallel with said edge in one direction and preventing relative movement therebetween in the opposite direction, at least one sheet of each pair including a plurality of elongate, longitudinally aligned tongues along said common edge, said tongues each having an inner end integral with the sheet and a free end, means securing a portion of the free end of the tongues of a sheet directly to the adjacent, continuous surface of the other sheet of a pair with those portions of the tongues between the inner ends and the secured portion being free of connection and unsecured, said unsecured tongue portions constituting flexible connector links between said interconnected sheets, whereby the limited relative movement is obtained.

2. A continuous, zig-zag folded, multi-sheet business form comprising two or more record sheets, means interconnecting said sheets in sequential pairs with the lower sheet of each preceding pair constituting the upper sheet of the next succeeding pair, said means interconnecting said sheets along a common free side edge for limited relative movement along an axis parallel with said edge in one direction and preventing relative movement therebetween in the opposite direction, at least one sheet of each pair including a plurality of elongate, longitudinally aligned tongues along said common edge, said tongues each having an inner end integral with the sheet and a free end, means securing a portion of the free end of the tongues of a sheet directly to the adjacent, continuous surface of the other sheet of a pair with those portions of the tongues between the inner ends and the secured portion being free of connection and unsecured, said unsecured tongue portions constituting flexible connector links between said interconnected sheets, whereby the limited relative movement is obtained, a transfer sheet between each pair of interconnected record sheets, and means securing a side edge of said transfer sheet directly to the under-side of the upper record sheet of an interconnected pair along the common free side edge thereof.

3. A continuous, zig-zag folded, multi-sheet business form as set forth in claim 1, wherein the common free side edge is provided with a tear line inwardly of the tongues.

4. A continuous, zig-zag folded, multi-sheet business form as set forth in claim 3, wherein the common free side edge is provided with a plurality of longitudinally aligned openings outwardly of the tear line.

5. A continuous, zig-zag folded, multi-sheet business form as set forth in claim 1, wherein the tongues all extend in the same direction.

6. A continuous, zig-zag folded, multi-sheet business form as set forth in claim 1, wherein the tongues of each succeeding record sheet are staggered and adhered to the next adjacent record sheet at a point displaced from the tongues of the adjacent record sheet.

7. A continuous, zig-zag folded, multi-sheet business form as set forth in claim 2, wherein the common free side edge is provided with a tear line inwardly of the tongues and wherein the transfer sheets are secured to the common free side edge between the tongues and the tear line.

References Cited in the file of this patent

UNITED STATES PATENTS

1,954,423	Meisel	Apr. 10, 1934
2,259,358	Templeton	Oct. 14, 1941
2,800,342	Burgmer	July 23, 1957
2,907,585	Sornberger et al.	Oct. 6, 1959

FOREIGN PATENTS

907,845	France	July 23, 1945