Oct. 4, 1966 J. A. PELEZZARE 3,276,450

BINDING MEANS

Filed Feb. 15, 1965 2 Sheets-Sheet 1

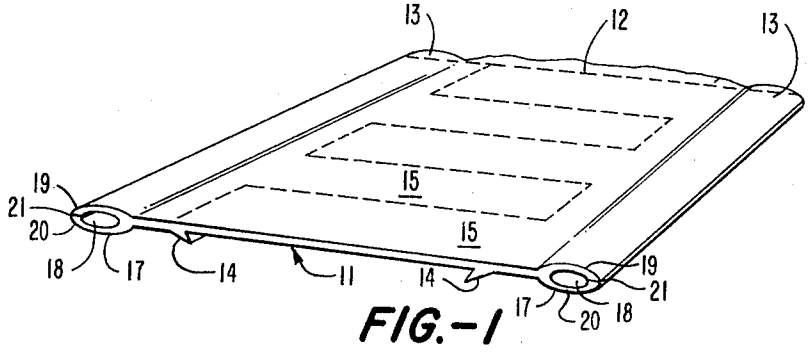


FIG.-1

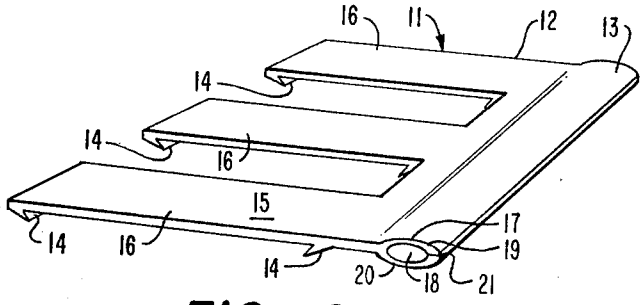


FIG.-2

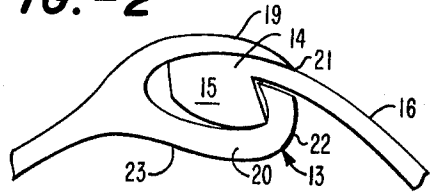


FIG.-4

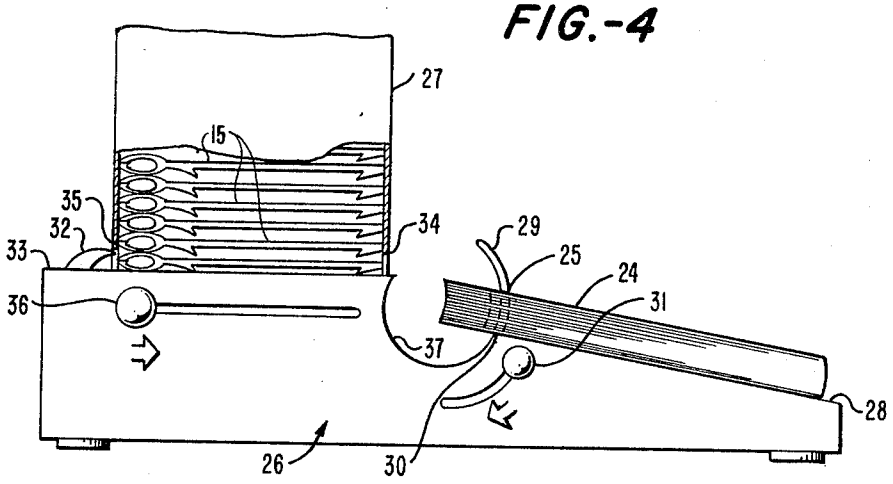


FIG.-5

INVENTOR.
JOSEPH A. PELEZZARE

BY

Fraser & Bagucki

ATTORNEYS

Oct. 4, 1966 J. A. PELEZZARE 3,276,450

BINDING MEANS

Filed Feb. 15, 1965 2 Sheets-Sheet 2

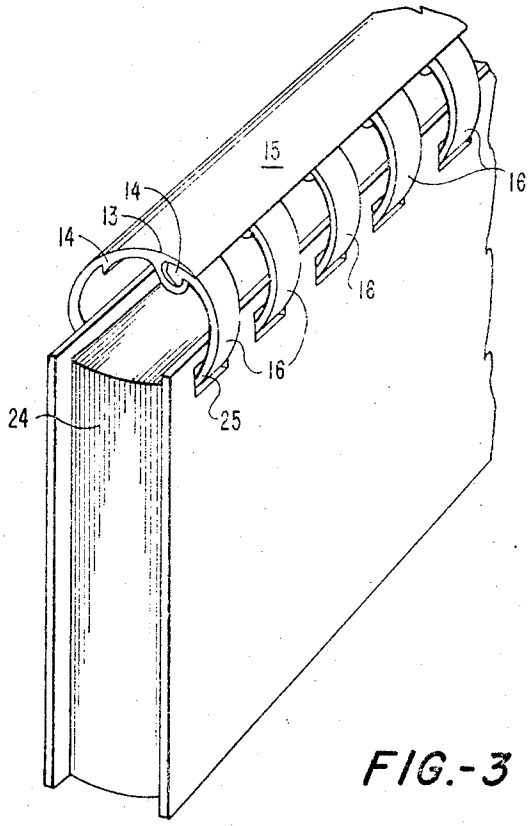
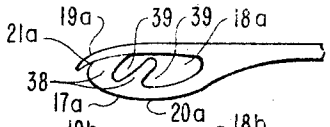
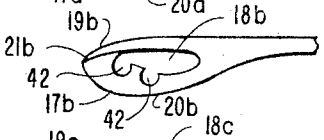
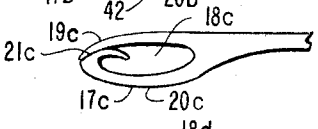
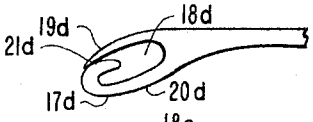


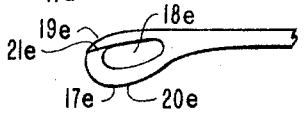
FIG.-3











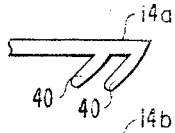


FIG.-6

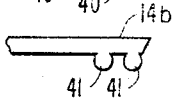


FIG.-7



FIG.-8

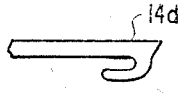


FIG.-9

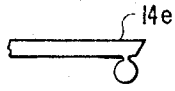


FIG.-10

INVENTOR.
JOSEPH A. PELEZZARE

BY

ATTORNEYS

United States Patent Office

3,276,450

Patented Oct. 4, 1966

3,276,450

BINDING MEANS

Joseph A. Pelezzare, 11947 Kiowa St., Apt. 1, Los Angeles, Calif.

Filed Feb. 15, 1965, Ser. No. 432,488

6 Claims. (Cl. 129—1)

The present invention generally relates to binding means and to a method of forming the same, and more particularly relates to an improved binder-forming sheet and an improved binder for releasably holding together a plurality of sheets, and to an improved method of fabricating the binder.

Various types of binders have been devised to releasably secure a plurality of sheets of material, such as looseleaf paper or the like, in stacked relation. Such binders includes those relatively expensive and cumbersome binders which employ a stiff, longitudinally extending central backbone and a plurality of stiff, spaced, ring-shaped split fingers disposed along the backbone. The two halves of each of the fingers have to be separated and approximated, as by a complicated opening and closing mechanism, or manually, in order to secure the same around a plurality of sheets of paper or the like material to be held in place by the binder. In another conventional form of looseleaf binder, the components are thin, flat, spaced fingers connected to one or both sides of a thin flat central backbone. The fingers are inserted through holes in the stack of paper to be bound together, after which the fingers are curled in a generally circular or loop fashion and then connected to the backbone of the binder as by gluing or by mating with usually relatively inaccessible complementary notches, slots, holes or the like in the binder backbone. In such instances, connection of the fingers to the backbone is usually relatively difficult and/or time-consuming and in many instances is permanent. Moreover, most of such flexible binders are relatively flimsy and weak so as to be ill adapted for extended use.

It would be desirable to provide an inexpensive, lightweight, flexible binder of compact size and shape featuring improved durability, stability and ease of use. Such binder should be capable of rapid and easy engagement with and disengagement from stacked material for efficient use and reuse. It should also be capable of supporting a considerable weight of stacked material over an extended period of time without losing its dimensional stability. The binder should also be capable of being readily sealed in binding position.

Accordingly, it is the principal object of the present invention to provide improved binder-forming and binding means.

It is also an object of the present invention to provide a method of making an improved binder.

It is a further object of the present invention to provide an improved lightweight yet durable looseleaf binder which is relatively inexpensive and is of compact and simple design, and which is capable of extensive reuse without material wear. Such binder should be capable of releasably securing and also permanently securing looseleaf material in an improved convenient manner.

It is a further object of the present invention to provide a method of fabricating an improved, inexpensive, lightweight, durable looseleaf binder having controlled flexibility.

The foregoing and other objects are accomplished in accordance with the present invention by providing an improved binder capable of securely yet readily releasably binding together a stacked plurality of sheets of paper or other looseleaf material. The binder can also be permanently secured in place for use as a permanent binding means. A plurality of the improved binders can be

inexpensively and rapidly fabricated from a continuous sheet of flexible material in accordance with the novel method of the present invention.

The improved binder is characterized by a strong, thin longitudinally extending spine and by spaced laterally extending flexible fingers which securely but releasably connect to the spine in an improved manner utilizing a minimum amount of force. All components of the binder can be formed substantially simultaneously from a single sheet of material, so that fabrication costs can be reduced while strength of the binder can be increased.

More specifically, the binder comprises a generally flat flexible or resilient sheet, preferably of extruded plastic, and having a relatively stiff longitudinally extending spine and a plurality of fingers spaced at intervals along one side thereof and extending transversely therefrom. The spine contains a loop adjacent one edge thereof, that is, the edge opposite that to which the fingers are attached. The loop contributes improved rigidity to the structure per unit weight. Thus, the loop defines an aperture extending the length of the spine. Access to the aperture is obtained through a slit extending from the outer periphery of the spine to the aperture, and the slit is readily openable for insertion into the aperture of a barb-like rib disposed adjacent the distal end of each finger.

When the binder is to be used, each finger is slipped through an opening in looseleaf paper or the like containing appropriately spaced holes, whereupon each finger is curled around so that it can be inserted through the slit into the aperture in the loop of the spine to releasably secure the finger to the spine. The resilient nature of the binder material aids in keeping the ribs in position within the aperture in the spine but still allows their release from the aperture when it is desired to disengage the binder from the looseleaf material. The portion of the spine defining the aperture is termed a loop, since it has that overall configuration, which is provided by an upper thin resilient lip resting on the terminal portions of a lower, thicker, less resilient hook which largely defines the aperture in the loop and is separated from the lip by the previously described openable slit. Moreover, the portion of the loop defining the aperture is so configured that at least the outer periphery of the aperture is complementary in size and shape to the terminal rib on each finger so as to improve releasable locking therebetween.

The spine has a relatively thicker cross section than do the thin fingers extending from one side thereof, so that the spine has a stiffening effect on the binder, while the resiliency and thinness of the fingers facilitate the engagement and disengagement of their ribs with the spine.

Since the binder is of relatively flat configuration, it can be readily painted, stamped or otherwise marked with indicia. Moreover, it takes very little space when shipped or stored. In addition, the relatively flat form of the binder adapts it for automatic use. Thus, a vertical stack of binders can be automatically or machine fed from a hopper into contact with successive stacks of binder material for automatic binding thereof. Moreover, the particular configuration of the ribs is such as to facilitate insertion thereof through the slits with a maximum of ease. In addition, the binder is smooth, neat and streamlined in appearance, and presents no sharp exposed edges when in use. Of particular importance, the binder configuration is such that two identical binders can be readily formed simultaneously from a single specially configured sheet of flexible material in a manner which obviates waste of material, so that the binder is particularly adapted for inexpensive fabrication.

Further objects, features and advantages of the present invention will become apparent from a study of the fol-

lowing detailed description and the accompanying drawings of which:

FIG. 1 is a perspective view of one embodiment of a binder-forming sheet of the present invention comprising extruded plastic material before cutting thereof along the illustrated dotted lines into two complementary binders of the present invention;

FIG. 2 is a perspective view of one of the two binders cut from the sheet of FIG. 1;

FIG. 3 is a perspective view illustrating the binder of FIG. 2 releasably connected to a stack of looseleaf filler material;

FIG. 4 is an enlarged fragmentary side elevation of the releasable locking arrangement of the binder of FIGS. 2 and 3;

FIG. 5 is a schematic side elevation of a binding machine which can be used to bind successive stacks of looseleaf filler material with the binder of the present invention;

FIG. 6 is a fragmentary enlarged side elevation of a second embodiment of the rib and loop portions of the binder of the present invention;

FIG. 7 is an enlarged fragmentary side elevation of a third embodiment of the rib and loop portions of the binder of the present invention;

FIG. 8 is an enlarged fragmentary side elevation of a fourth embodiment of the rib and loop portions of the binder of the present invention;

FIG. 9 is an enlarged fragmentary side elevation of a fifth embodiment of the rib and loop portions of the binder of the present invention; and,

FIG. 10 is an enlarged fragmentary side elevation of a sixth embodiment of the rib and loop portions of the binder of the present invention.

Now referring more particularly to FIG. 1 of the accompanying drawings, a binder-forming sheet **11** of flexible and resilient material, such as a metal, for example, aluminum, spring steel or the like, or a plastic such as polyvinyl plastic, polyethylene plastic or other synthetic plastic material, or a cellulosic material, such as resilient fiber board, paperboard or the like, is illustrated in perspective view in the fully formed condition prior to severing thereof into complementary sets of binders.

Thus, the sheet **11** comprises a relatively thin, flat, transverse webbed portion **12** extending between two thickened and stiffer spine portions **13** disposed along opposite longitudinal edges of the sheet **11**. Both the upper and the lower surfaces of the webbed portion are relatively smooth and flat, except that the lower surface is provided with a pair of barb-like ribs **14** integral therewith and depending therefrom. The ribs **14** extend parallel to and are spaced equidistant from the longitudinal side edges of the sheet **11**, as shown in FIG. 1. Each such rib **14** slopes inwardly and downwardly and is generally wedge-shaped or barb-like in form. The ribs **14** act as releasable locking means for pairs of identical and complementary binders **15** to be severed from the sheet **11**.

The sheet **11** can be severed into two mating binders **15** by cutting along the indicated dotted lines, the length of which binders **15** is regulated by transversely severing the sheet at an appropriate point. It will be noted that the binders of the present invention can be fabricated on a batch, semicontinuous or continuous basis by carrying out the appropriate severing operations on a continuous sheet **11** or a plurality of discontinuous sheets **11**.

As an example, the sheet can be severed according to the pattern illustrated in FIG. 1 by dotted lines. Thus, staggered cut lines alternating between opposite sides of the sheet **11** in the area between each rib **14** and the adjacent spine **13** and in a longitudinal direction parallel to the side edges of the sheet **11** can be interconnected by parallel transverse cut lines. All such cuts can be made sequentially or simultaneously with each other. Moreover, as shown in FIG. 1, transverse cuts can be provided from the side edge to opposite side edge of the sheet **11** to completely divide the same into complementary sets of binders **15**. In each such set, two complementary binders **15** generally of the configuration set forth in FIG. 2 can be provided.

Each binder **15** thus provided comprises a stiff, thickened, longitudinally extending spine **13** and a plurality of thin, resilient, parallel fingers **16** extending transversely from one side margin of the spine and formed from the web **12** of the sheet **11** by the previously described cutting operations. The fingers **16** are integral with the spine. Adjacent the distal free end of each finger and depending from the underside thereof there is provided the barb-like rib **14** which is inclined toward the spine **13**. A second non-terminal rib **14** is also provided on the underside of each finger between the terminal rib **14** and the spine **13**, as shown in FIG. 2. The spine contains a longitudinally extending loop **17** defining a central aperture **18**. The loop **17** comprises an upper, thin, resilient lip **19** and a lower, generally thicker, resilient hook **20** separated by a slit **21** extending from the aperture **18** to the outer periphery of the spine **13**. The slit **21** can be formed during fabrication of the spine **13** or can be cut into the spine **13** thereafter. The lip **19** releasably abuts the hook **20**, as shown in FIGS. 1 and 2. Moreover, the lip **19** can taper at its outer periphery so as to cooperate with the fingers **16** and form with each such finger **16** a relatively smooth continuous surface when the ribs **14** are inserted into the aperture **18**, as shown in FIG. 4.

Each rib **14** is configured such that it generally conforms to at least the outer periphery of the aperture **18**, as shown in FIG. 4, for an improved releasable locking effect. Preferably, each rib **14** conforms to substantially all of the cross-sectional configuration of the aperture **18**. The tapered leading portion of each rib **14** facilitates its passage through the slit **21** into the aperture **18**. The generally upwardly directed terminal portion **22** of each hook (together with the generally transverse intermediate portion **23** thereof) facilitates secure but releasable gripping of each terminal rib **14** in the aperture **18**.

It will be noted that the spine **13** is stiffened in contrast to the relatively thinner fingers. In this regard, as previously noted, the configuration of the spine **13** i.e. with the loop **17** and aperture **18**, provides a larger, stronger spine without additional weight, and therefore a strengthened binder without additional weight. Although the entire binder **15** is somewhat flexible, depending upon the particular materials of construction, the fingers **16** are very flexible, much more so than the spine **13**. The spine **13** has the net effect of stabilizing the remainder of the binder **15** when the binder is in use.

As shown more particularly in FIG. 3 of the accompanying drawings, the embodiment illustrated in FIGS. 1–4 is adapted to be readily releasably secured to a stacked plurality of sheets **24** of suitable material such as looseleaf paper or the like, with or without coverboards, etc. which sheets, boards, etc. are provided with slits, holes or slots **25** spaced adjacent one longitudinal side thereof in a manner which corresponds to the spacing of the spaced fingers **16** of the binder **15**.

In releasably connecting the binder **15** to said stack **24** of filler material, the flat binder **15** of FIG. 2 is moved into a position such that the spine **13** thereof parallels the longitudinal axis of the stack **24** and the fingers **16** approximate the slits **25**. The fingers **16** are then inserted through the slits **25** and, due to the inclined sloping nature of the ribs **14**, no resistance is met in feeding the fingers **16** through the slits **25**. After the fingers **16** are fed completely through the slits **25** so as to extend from the opposite side of the stack **24**, the fingers **16** are then curled toward the spine in order to releasably connect the terminal rib **14** adjacent the distal end of each finger **16** with the spine **13** by inserting that rib **14** into the aperture **18** through the slit **21**.

It will be noted that the non-terminal rib **14** disposed on each finger serves the important purpose of indexing each finger so that each finger **16** can be curled in the correct direction with respct to the spine **13** i.e. in a direction such that the non-terminal rib **14** is on the inner surface of the circle formed by the curled finger **16**, as shown in FIG. 3. In this position, there is a maximal locking action between the terminal rib **14** and the loop **17**, inasmuch as there is a component of force directed downwardly and one directed outwardly by the finger **16** acting through the terminal rib **14** upon the thick hook **20**. Both such components of force act to clamp the rib **14** in the portion of the aperture **18** defined by the hook **20**. If, instead, the finger **16** is curled in the opposite direction so that the non-terminal rib **14** is on the outer surface thereof, when the terminal rib **14** is inserted through the slit into the aperture **18**, there is a minimum locking action, since the curled finger **16** acts through the terminal rib **14** and exerts upon the loop **17** an upwardly directed component of force and a medially directed component of force, both of which tend to force the thin lip **19** up and away from the hook **20**, thus increasing the possibility of the terminal rib **14** inadvertently slipping from the aperture **18**.

With each finger **16** curled into a circle so that in each instance the non-terminal rib **14** thereof is on the inner surface of the circle and the terminal rib **14** is engaged with the loop **17** by insertion into the aperture **18**, all finger **16** are securely yet readily releasably engaged to the spine **13** so that the stack of sheets **24** are securely held in position by the binder **15**, as shown in FIG. 3. However, when it is desired to separate the stack of sheets **24** from the binder **15**, this can be accomplished very easily merely by compressing each ring formed by each finger and simultaneously moving each terminal rib **14** upwardly and medially to clear that rib **14** of the terminal portion **22** of the hook **20**, and then allowing that rib **14** to pass from the aperture **18** through the slit **21**. Accordingly, the binder **15** is completely reusable and is easily and efficiently employed to releasably hold looseleaf materials.

The binder **15** provides high strength and resilience with a minimum of weight. Moreover, the outermost surface of the binder is relatively smooth and streamlined so as to provide the binder with an attractive appearance. The lip **19** blends with the contour of each finger **16** when the terminal rib **14** thereof is engaged in aperture **18**, so that the streamlined smooth appearance of the binder is enhanced. No unsightly projections are provided which would tend to cause the binder **15** to catch at the hook **20** or lip **19** of the loop **17** and would cause the loop **17** to inadvertently open or would mar the appearance of the binder **15**.

The binder **15** of the present invention can be utilized in a manual looseleaf binding operation, as described. However, it can also be employed in an automatic operation with any suitable machine, such as that schematically illustrated in FIG. 5 of the accompanying drawings. In FIG. 5, a binding machine **26** is shown in side elevation and includes a plurality of binders **15** vertically stacked within a holder **27**, a portion of which is broken away to illustrate the arrangement of the binders **15**. The fingers **16** of the binder **15** in the stack are directed toward a stacked plurality of sheets **24** of looseleaf material disposed on an inclined plane **28** or surface of the machine **26**. A plurality of finger guide members **29** are retractably mounted on the inclined surface **28** adjacent the uppermost edge **30** thereof, and are adapted to project through the holes **25** in the looseleaf filler material **24**, as shown in FIG. 5. The guide members **29** can be retracted into the machine **26** by moving the lever **31** in the direction of the arrow shown in FIG. 5, and are extensible by releasing the lever **31**, which lever is upwardly spring-biased. The device **26** is also provided with a slide bar **32** projecting upwardly from surface **33** of the machine,

and inclined toward the lowermost binder **15** in the vertical stack thereof. The slide bar is adapted to slide horizontally above the surface **33**, and urge the lowermost binder **15** in the stack thereof toward the stack **24** of looseleaf material by engagement with the spine **13** thereof. In order to facilitate this urging, the holder **27** has the lower end thereof cut away at the front **34** and rear **35**, as shown in FIG. 5, to just above the level of the lowermost binder **15** in the stack thereof. The urging action of the slide bar **32** is controlled by forward movement of a rearwardly spring-biased knob **36**, as shown in FIG. 5.

Binding of the stack of filler material is carried out by first positioning a stack **24** of looseleaf material on the surface **28** and holding the stack **24** thereon by allowing the curved guide members **29** to extend upwardly through the slots **25** thereof, as shown in FIG. 5. The knob **36** is then moved in the direction toward the stack of binder material, thus causing the slide bar **32** to move in the same direction and push the lowermost binder **15** of the vertical stack ahead of it. It will be noted that the guide members **29** extend in an arc toward the stack of binders **15** and above the level of the lowermost binder **15**. Accordingly, as the fingers **16** of said lowermost binder **15** come into contact with the arcuate guide members **29** they are deflected downwardly through the slits **25** in the stack **24** of looseleaf binder material. The fingers **16** of the binder **15** are thus completely fed through the corresponding slits **25** in the binder material **24**. An arcuate guide surface **37** is provided in the machine **26** below the stack **24**, as illustrated, so that upon further forward urging of the binder **15**, the fingers **16** are caused to travel along an arcuate path defined by the surface **37** and thus to proceed upwardly toward the spine **13** of the binder **15**. The terminal ribs **14** are thereupon urged into releasable engagement with the aperture **18** in the spine **13** while the spine is maintained in rib-engaging position by the curved slide bar **32**. Accordingly, each finger **16** of the binder **15** is curled into a circle and releasably locked with the aperture **18** of the spine **13**, thereby securely holding the stack **24** of looseleaf material, as illustrated in FIG. 4.

Once the stack **24** of looseleaf filler material is bound in the indicated manner, the slide bar **32** can be allowed to return to its initial position shown in FIG. 5, as by spring-biased action, and guide members **29** can be retracted by pushing down on lever **31**, whereupon the bound stack of material can be removed from the sloping surface **28**. The machine **26** is then ready to receive another stack **24** of looseleaf material on the surface **28** and to bind the same to the now lowermost binder **15** in the vertical stack, as by the above-described procedure.

It will be understood that while the above description is mainly directed to the use of the binder of the invention as means for releasably binding looseleaf material, such binder is equally well adapted for use in the permanent binding of stacked material. Permanent binding is most easily accomplished when the binder is fabricated of thermoplastic material. As an example, after the fingers of the binder are passed through holes in the stacked material and are curled in place and after terminal ribs are positioned in the aperture of the loop, those ribs can be permanently sealed in such aperture, as by gluing, etc. but preferably by heat sealing. Thus, the lip can be fused to the terminal ribs in a separate operation, as by contact with a heat sealing knife, bar or the like. Alternatively, utilizing a machine as described above, the slide bar can be in a form which not only opens the slit in the loop and acts as guide means for the terminal ribs, but also includes heating tips which contact the ribs in the aperture to permanently heat seal the same to the loop at the end of the binding operation.

Although the described manual and machine binding operations can be carried out readily and smoothly and at a relatively rapid rate utilizing the binder of the present

invention in the configuration illustrated in FIGS. 1–5, the binder of the present invention can also be used with equal facility and advantage when in the form of comparable embodiments such as those illustrated in FIGS. 6–10 of the accompanying drawings. In the embodiments of FIGS. 6–10, all components not illustrated are essentially the same as those of the embodiment of FIGS. 1–5.

It will be noted when comparing the embodiments of FIGS. 6–10 with that of FIGS. 1–5 that in each instance the spine is characterized by a loop having a relatively thin upper lip and a lower thicker less resilient hook separated therefrom by a slit. At least the outer periphery of the aperture defined by the hook is configured to about mate with the terminal rib on each finger of the binder so as to increase the positive releasable locking action effected between the hook and terminal rib. Comparable components of the binder illustrated in FIG. 6 bear the same numerals as those of the embodiments of FIGS. 1–5, but are succeeded by the letter *"a."* Comparable components of the remaining embodiments of FIGS. 7–10, inclusive, also bear the same numerals, but succeeded by the letters *"b," "c," "d" and "e,"* respectively.

Now referring more particularly to FIG. 6 of the accompanying drawings, a portion of a second embodiment of the binder of the present invention is illustrated in enlarged schematic fragmentary side elevation, more particularly the loop and terminal rib portions thereof. In FIG. 6, the loop **17***a* includes a hook **20***a* bearing a pair of spaced upwardly and inwardly inclined teeth **38** defining a pair of similarly oriented cavities **39**. The mating terminal rib **14***a* of the device comprises a complementary pair of spaced downwardly inclined teeth **40** adapted to be received in the cavities **39** for improved releasable engagement. It will also be noted that the lip **19***a* is tapered at its extremity and extends slightly beyond the hook **20***a*. With such an arrangement, the lip **19***a* not only has a smooth streamlined appearance but also acts as a guide for the terminal rib **14***a* when it is desired to engage that rib **14***a* with the slit **21***a* and pass that rib **14***a* therethrough and into the aperture **18***a*.

As shown in FIG. 7 of the accompanying drawings, a third embodiment of the present invention includes a rib **14***b* comprising a pair of spaced cylindrical locking members **41** adapted to fit a mating pair of cavities **42** provided in the hook **20***b*. Again, improved releasable locking is provided between the rib **14***b* and hook **20***b*.

In FIGS. 8, 9 and 10, embodiments of the present invention are illustrated in each of which the terminal rib of each finger comprises a single downwardly (and rearwardly in FIGS. 8 and 9) projecting component and in which the hook has a cooperating configuration including a smooth intermediate portion, and in the embodiments of FIGS. 7 and 8 an inwardly directed terminal portion. In the embodiments of FIGS. 9 and 10, the hook is bent downwardly to further facilitate releasable connection of the terminal rib therewith. All of such embodiments provide improved cooperative releasable engagement between the hooks and fingers (terminal ribs thereof) in accordance with the present invention.

Thus, the present invention provides an improved flexible binder-forming sheet, an improved flexible binder and an improved method of making the binder. The binder features improved ease of engagement and disengagement of components thereof with looseleaf filler or other material to be bound, can be reused a large number of times without deterioration, has an improved appearance and simplified construction, and is further characterized by improved strength, durability and stability. The binder is also adapted for convenient permanent binding of stacked material. Moreover, the binder can be fabricated of readily available inexpensive materials in a simplified, economical manner and in a large quantity from stamped. extruded or otherwise readily formed sheets. The method of the present invention involves the fabrication of the binder in an improved, simplified, economical manner so as to minimize cost, waste and time. Other features of the present invention are as set forth in the foregoing.

Various modifications, changes, alterations and additions can be made in the present binder, binder-forming sheet and the method of manufacturing the binder. All such alterations, changes, additions, and the like which are within the scope of appended claims form a part of the present invention.

What is claimed is:

1. A binder-forming article of manufacture comprising a sheet of resilient flexible material which includes a thin, flat, transversely extending web and two thickened longitudinally extending spines formed integral with the web and disposed along opposite side margins thereof, each spine defining a loop, each loop defining an aperture and a slit extending from the outer periphery of the loop into communication with said aperture, the outer periphery of each of said loops comprising an upper, thin, resilient, generally transversely extending lip portion and a lower releasably abutting resilient hook portion which includes a generally transversely extending portion and a generally upwardly extending terminal portion, said sheet also including at least a pair of generally downwardly and inwardly extending resilient ribs aligned generally parallel to the longitudinal side margins of said sheet and disposed a predetermined distance from each other and from said longitudinal side margins.

2. A binder-forming article of manufacture comprising a sheet of resilient flexible material which includes a thin, flat, transversely extending web and two thickened longitudinally extending spines formed integral with the web and disposed along opposite side margins thereof, each spine defining a loop, each loop defining an aperture and a slit extending from the outer periphery of the loop into communication with said aperture, the outer periphery of each of said loops comprising an upper, thin, resilient, generally transversely extending lip portion and a lower releasably abutting resilient hook portion which includes a generally transversely extending portion and a generally upwardly extending terminal portion, said sheet also including at least a pair of generally downwardly and inwardly extending resilient ribs aligned generally parallel to the longitudinal side margins of said sheet and disposed a predetermined distance from each other and from said longitudinal side margins, the configuration of at least one of said ribs being complementary to at least the side marginal portion of the aperture defined by the loop disposed on the side of said sheet opposite to said rib, whereby improved releasable engagement between said rib and said loop is provided, and said lip of at least one of said loops projecting beyond the hook portion of the same loop, whereby a guide is provided to the area between said lip and hook so as to facilitate positioning of said rib in the aperture of said loop through said slit.

3. An improved resilient binder comprising a thickened longitudinally extending resilient spine containing a longitudinally extending loop defining an aperture and a slit extending from the outer periphery of the loop into communication with the aperture, said loop comprising an upper thin resilient lip and a lower releasably abutting resilient hook, a plurality of thin resilient fingers spaced from one another and extending transversely from one side margin of said spine and integral therewith, and at least one resilient rib per finger, each rib being disposed adjacent the distal free end of a given finger and depending therefrom, each rib being inclined toward said loop and having a configuration adapted to readily releasably engage with said loop through said slit.

4. An improved resilient binder comprising a thickened longitudinally extending resilient spine containing a longitudinally extending loop defining an aperture and a slit extending from the outer periphery of the loop into communication with the aperture, said loop comprising an

upper thin resilient lip generally parallel to said spine and a lower releasably abutting resilient hook portion, including an intermediate portion generally parallel to said spine and a terminal portion generally perpendicular to said spine, a plurality of thin resilient fingers spaced from one another, extending transversely from one side margin of said spine and integral therewith, and at least one resilient rib per finger, each said rib being disposed adjacent the distal free end of a given finger and depending therefrom, each said rib being inclined inwardly toward said loop and having a configuration adapted to readily releasably engage said loop through said slit, said spine being sufficiently stiffer and thicker than each of said fingers so as to strengthen said binder, and said lip being tapered at its outer periphery so as to cooperate with said finger and form a relatively smooth continuous surface with said finger when said rib is inserted through said slit into said aperture and releasably engaged with said loop.

5. The binder of claim 4 wherein each of said fingers is integral with said spine, wherein said fingers are parallel with each other, wherein each of said ribs has a configuration complementary to that of at least the outer periphery of the aperture in said loop, and wherein said lip of said loop extends beyond the outer periphery of the hook portion of the loop, whereby a guide is provided between the lip and hook to facilitate positioning of each of said ribs in the aperture of said loop through said slit.

6. The binder of claim 4 wherein said fingers, ribs and spine are integral with one another and all comprise flexible resilient synthetic plastic, wherein said spine has a substantially greater thickness and stiffness than said fingers, wherein each of said ribs is generally wedge-shaped, whereby passage thereof through openings in looseleaf material to be bound and into and through said slit into said aperture is facilitated, and wherein the configuration of each of said ribs is complementary to that of a sufficient proportion of said aperture so as to securely releasably lock said rib into said loop when said rib is disposed in said aperture.

References Cited by the Examiner

FOREIGN PATENTS

1,193,178	4/1959	France.
1,102,700	3/1961	Germany.
726,966	3/1953	Great Britain.

JEROME SCHNALL, *Primary Examiner.*