FASTENER FOR USE IN RING BINDERS

Technical Field

This invention relates to ring binders for holding hole punched paper and the like, and more particularly, to a fastener for securing a ring metal of a ring binder mechanism to a spine portion of the binder.

Ring binders for holding paper and other hole punched materials employ a ring binder mechanism which is secured to a spine of the binder cover. The ring binder mechanism comprises a ring metal assembly, and a plurality of binder rings which are openable and closeable for the insertion and removal of material such as hole-punched sheets of paper or similar materials. The binder ring and a lever mechanism by which the rings are opened and closed form part of the ring metal assembly. A plate or shield covers the lever mechanism and has provisions at each end for attachment of the ring metal to the spine of the binder cover. It is now possible to attach the ring metal to the spine section of the binder cover using a number of different fasteners such as taught in U.S. Patents No. 5,755,513 to *To*, No. 5,160,209 to *Schuessler*, and No. 5,100,253 to *Cooper*; as well in applicant's own co-pending U.S. patent applications 009,901/09 and 082,265/29 both filed January 20, 1998, U.S. patent application 086,577/29 filed April 15, 1998.

A feature of these various fasteners is that, for cosmetic purposes, it is desirable to secure the ring binder mechanism to the binder in a way which is not visible. Each of the fasteners described in the above referenced U.S. patents and co-pending patent applications have an upright rivet or eyelet structure extending from one side of a plate. The rivet or eyelet portion of these fasteners pass through openings in the binder mechanism and are attached thereto. A number of prongs adapted to grip an interior surface of the binder spine extend from the opposite side of the plate so the ring metal/fastener subassembly can be secured to the binder cover.

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Various of the prior art fasteners have certain drawbacks. For example, as shown in Figure 4A of the '513 patent, many of the fasteners have prongs formed by punching them out of a rectangular plate. This produces non-uniformity in the amount of material about the fasteners with the areas where there is less material forming possible points of weakness. Further, the rectangular configuration of the plate requires that each fastener be oriented such that the longest dimension of the attachment plate is properly oriented along the spine of the binder before attachment. This not only hinders an automated assembly process, but incorrect orientation of the fastener causes interference between the cover and the attachment plate when the binder is folded closed. Also, the upright rivet structure used in certain of these prior art fasteners requires either a shoulder incorporated into the rivet structure, as shown in the '513 patent, or a separate supporting structure such as a sleeve or collar to hold the ring metal in position as the upper surface of the rivet is deformed to secure the ring metal, as shown in the '209 and '253 patents.

Background Art

Among the several objects of the present invention may be noted the provision of fastener to attach a binder ring metal to the spine of a binder irrespective of the orientation of the fastener;

the provision of such a fastener which is attaches to the spine of a binder such that no portion of the fastener is visible from the exterior of the binder so to provide a pleasing cosmetic appearance;

the provision of such a fastener which supports the ring metal and which securely and reliably affixes the ring metal to the binder cover;

the provision of such a fastener which is of a unitary construction, is generally circular in shape so to facilitate automated assembly, and can be used with existing ring metals;

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the provision of such a fastener to properly space the ring metal from the binder spine when the ring metal is secured to the binder cover so to insure proper operation of the mechanism which opens and closes the binder rings ;

the provision of such a fastener to have an eyelet end readily attachable to the ring metal;

the provision of such a fastener having a pointed tip end opposite the eyelet end and concentrically formed therewith for securing the ring metal to the spine;

the provision of such a fastener to have a hollow, blunt end opposite the eyelet end and concentrically formed therewith for securing the ring metal to the spine;

the provision of such a fastener in which the pointed tip end or hollow blunt end are readily deformable to secure the fastener to the binder spine;

the provision of such a fastener usable with a simple machine tool which attaches the one end of the fastener to the binder spine; and,

the provision of such a fastener which is a low cost part that is easily shipped and stored in bulk for use when needed.

In accordance with the invention, generally stated, a fastener securing a binder ring metal to a binder cover includes a hollow, cylindrical, deformable body. One end of the body is insertable through an opening in the ring metal and is deformable about the opening to affix the body to the ring metal. The other end of the body is pointed in one embodiment and blunt in another embodiment. In either embodiment, this end of the fastener is pushed through a portion of the binder cover and thereafter flattened to attach the fastener/ring metal subassembly to the binder cover. An annular flange is integrally formed on an outer surface of the body and extends circumferentially about the body. The flange spaces the ring metal a predetermined distance from the binder cover when the pointed or blunt end of the fastener body is pushed through the binder cover. Other objects and features will be in part apparent and in part pointed out hereinafter.

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Brief Description of the Drawings

In the drawings, Fig. 1 is an exploded perspective view of a ring binder assembly;

Fig. 2 is a perspective view of a first embodiment of a fastener of the present invention;

Figs. 3 and 4 are respective top and bottom plan views of the fastener;

Fig. 5 is a side elevational view of the fastener;

Fig. 6 is a perspective view of a second embodiment of the fastener;

Fig. 7 is an end plan view of the fastener;

Fig. 8 is a side elevational view of the fastener;

Fig. 9 illustrates a first step in the attachment of a ring metal to a binder cover using a fastener of the present invention; and,

Figs. 10 and 11 illustrate subsequent steps in the attachment process.

Corresponding reference characters indicate corresponding parts throughout the drawings.

Best Mode for Carrying Out the Invention

The following detailed description illustrates the invention by way of example and not by way of limitation. The description clearly enables one skilled in the art to make and use the invention, describes several embodiments, adaptations, variations, alternatives, and uses of the invention, including what I presently believe is the best mode of carrying out the invention.

Referring to the drawings, a binder 10 for holding hole punched sheet of paper (not shown) has side leaves 12 and 14, and a center spine section 16, intermediate the leaves. A ring metal binder mechanism 18, constructed as is well-known in the art, is attached to the spine. Incorporated in the ring metal binder are a plurality of binder rings 20, and mechanisms 21 (see Figs. 10 and 11) for opening and closing the rings in response to movement of levers 22 and 24 at respective ends of the ring metal. Heretofore, rivets were typically used to secure the ring metal the binder spine through rivet openings 26 and 28 in a

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cover or shield 30 of the ring metal. Recently, these rivets have been replaced by fasteners such as shown and described in the previously mentioned U.S. patents and co-pending patent applications.

In accordance with the present invention, a fastener, indicated generally at 32 can be used in place of these other fasteners to affix ring metal 30 to binder spine 16. As shown in Fig. 1, two such fasteners are used, one at each end of the ring metal. Referring to Figs. 2-5, each fastener 32 comprises a hollow, cylindrical, body 34 which is made of a deformable material. One end 36 of body 34 is formed for insertion through one of the openings 26, 28 in shield 30. After insertion through the opening, this end of the fastener body is deformable about the opening for the fastener to be affixed to the ring metal. The opposite end 38 of body 34 is pushed through a portion of the binder cover and thereafter deformed to attach the fastener 32/ring metal 18 subassembly to the binder cover. An annular flange 40 is formed on an outer surface of body 34 and extends circumferentially around the fastener. The flange is used for spacing the ring metal a predetermined distance from the binder cover, after the fastener/ring metal subassembly is affixed to the binder cover, so the ring metal is positioned a desired distance from the binder cover after fastener 32 is attached to the cover.

In more detail, in the embodiment of the fastener shown in Figs. 2-5, end 38 of the fastener body forms a tapered, pointed end which is insertable through the spine portion of the binder cover as shown in Figs. 10 and 11. The other end 36 of the fastener body has a recess 42 formed therein. The recess is formed by a shoulder 44 at a juncture between a first and larger outer diameter portion of body 34 and a second and smaller outer diameter end portion of the body. The larger diameter portion of body 34 extends generally the length of the fastener, except for the tapered portion of the fastener at the one end, and the recessed portion at the other. The smaller diameter portion 42 of the fastener has an outer diameter corresponding to the diameter of openings 26, 28 in ring metal 18 for end 36 of

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the fastener to fit through the opening and for the underside of the opening to seat against the shoulder of the recess (see Fig. 9).

Referring to Figs. 9-11, end 36 of the fastener is first fitted through an opening 26, 28 as shown in Fig. 9. End 36 is then deformed over the lip of the opening to secure the one end of the fastener to the ring metal. A similar procedure is performed with another fastener at the other end of the ring metal. Next, the fastenet/ring metal subassembly is positioned for the pointed end 38 of the fastener to be seated against spine 16 of the binder cover. A tool 100, as shown in Figs. 10 and 11, includes an anvil 102 over which is slidably received a socket 104. The socket is cylindrically shaped and has at least one longitudinally extending lost motion slot 106 which moves relative to an outwardly projecting boss 108 formed on the side of the anvil. The anvil is formed at the outer end of a plunger 110 over which is seated a spring 112 that also seats against a base of socket 104. As shown in Figs. 10 and 11, the tool is mounted beneath the portion of the binder spine against which the tip end of the fastener bears.

In operation, tool 100 moves upwardly. As it does, the outer rim of socket 104 bears against the underside of the spine and pushes the spine upwardly against the fastenet. The force of the spring is sufficient to overcome any downward force exerted by the fastener so the upward movement of the tool pushes the tip end of the fastener through the spine. The diameter of flange 40 corresponds to the diameter of socket 104 so to allow the socket to push against the fastener only until the underside of the flange comes into contact with the upper surface of the spine. The location of the flange on the fastener body serves two purposes: first, its height above the tip end of the fastener is such as to allow a height d1 of the fastener to extend through the underside of the spine. Second, it defines a clearance height d2 between the top of the spine and the lever 22, 24 and ring opening mechanism 21, so there is no interference with their operation once the ring metal is secured to the binder cover. Once the movement of socket 104 is stopped by flange 40, anvil 102 continues its upward motion, now pressing

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against and flattening the tip end of the fastener extending beneath the underside of the binder spine, as shown in Fig. 11. This secures the fastener to the spine.

Refering to Figs. 6-8, a second embodiment of the fastener is indicated 132. This fastener has a cylindrical body 134 hollow throughout its length, an end 136 similarly formed to end 36 of fastener 32, for affixing the fastener to the ring metal, and an end 138 for securing the fastener/ring metal subassembly to the binder cover. In the drawings, the corresponding parts of fastener 132 have a prefix 1 in front of the corresponding reference numerals of fastener 32. Now, end 138 is formed in the same manner as end 136 of the fastener. That is, end 138 of the fastener body has a recess 146 formed therein. This recess is formed by a shoulder 148 at the juncture between the first and larger outer diameter portion of fastener body 134 and the second and smaller outer diameter end portion of the body. End 136 of fastener 132 is attached to ring metal 18 in the same manner as previously described. Blunt end 138 of the fastener is secured to spine 16 of the binder, also as before, using tool 100. Again, tool 100 flattens the portion of end 138 which penetrates below the spine. As with fastener 32, fastener 132 has an annular flange 140 for insuring proper depth of penetration of the spine material by end 138 of the fastener, and that there is adequate clearance for the lever mechanism of the ring metal.

It will be noted that in both embodiments, the fastener is a integral piece whose circular, uniform shape facilitates use of the fastener in an automated assembly process. Also, the fasteners are readily shopped and stored in bulk. Finally, the fasteners are available in different lengths and diameters for use in different size binders.

What has been described is fastener for attaching a binder ring metal to the spine of a binder irrespective of the orientation of the fastener, and such that no portion of the fastener is visible from the exterior of the binder. The fastener is of a unitary construction, is generally circular in shape for ease of facilitate automated assembly, and can be used with existing ring metals. The fastener

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supports the ring metal, securely attaches the ring metal to the binder cover, and properly spaces the ring metal from the binder spine so to insure proper operation of the binder mechanism. One end of the fastener forms an eyelet readily attachable to the ring metal, with the other end having either a concentrically formed pointed tip or a hollow, blunt end for securing the ring metal to the spine. Either of the pointed tip end or hollow blunt end are readily deformable to secure the fastener to the spine.

In view of the foregoing, it will be seen that the several objects of the invention are achieved and other advantageous results are obtained.

As various changes could be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

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Claims

1. A fastener for securing a binder ring metal to a binder cover comprising:

an elongate body deformable at each end for one end of said body to be affixed to said ring metal and the other end of said body to be attached to said binder cover; and,

spacer means formed on an outer surface of said body for spacing said ring metal a predetermined distance from said binder cover after said fastener is affixed to said binder cover so said ring metal is positioned a desired distance from said binder cover.

2. The fastener of claim 1 wherein said body comprises a hollow cylindrical body.

3. The fastener of claim 2 wherein one end of said body forms a tapered, pointed end insertable through said portion of said binder cover.

4. The fastener of claim 3 wherein an opposite end of said body is insertable through an opening in said ring metal for said opposite end to be deformed about said opening and affix said fastener to said ring metal.

5. The fastener of claim 4 wherein said outer surface of said cylindrical body at said opposite end has a recess formed therein forming a shoulder at a juncture between a first and larger outer diameter portion of said body and a second and smaller outer diameter end portion thereof, the diameter of said end portion of said body corresponding to the diameter of said opening for said ring metal to seat against said recess when said end portion of said body is inserted through said opening.

6. The fastener of claim 3 wherein said spacer means comprises an annular flange extending circumferentially about said body intermediate the ends thereof.

7. The fastener of claim 6 wherein said body and said flange are of an integrated, single-piece construction.

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8. The fastener of claim 6 wherein said pointed end of said body is punched through said binder cover by a tool to a depth corresponding to the distance between said pointed end and said flange, said pointed end of said body further being flattened by said tool after penetrating through said binder cover to secure said fastener and ring metal in place.

9. The fastener of claim 2 wherein one end of said body is insertable through an opening in said ring metal for said end to be deformed about said opening and affix said fastener to said ring metal.

10. The fastener of claim 9 wherein said outer surface of said cylindrical body at each end thereof has a recess formed therein forming a shoulder at a juncture between a first and larger outer diameter portion of said body and a second and smaller outer diameter end portion thereof, the diameter of said end portion of said body at said one end thereof corresponding to the diameter of said opening in said ring metal for said ring metal to seat against said recess when said end portion of said one end of said body is inserted through said opening.

11. The fastener of claim 10 wherein said spacer means comprises an annular flange extending circumferentially about said body intermediate the ends thereof.

12. The fastener of claim 11 wherein said body and said flange are of an integrated, single-piece construction.

13. The fastener of claim 11 wherein an opposite end of said body is punched through said binder cover by a tool to a depth corresponding to the distance between said opposite end and said flange, said opposite end of said body further being flattened by said tool after punching through said binder cover to secure said fastener and ring metal in place.

14. A fastener for securing a binder ring metal to a binder cover comprising:

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a hollow, cylindrical, deformable body, one end of said body being insertable through an opening in said ring metal and deformable thereabout for said body to be affixed to said ring metal, and an opposite end of said body being pushed through said binder cover and deformed thereafter to attach said fastener and said ring metal to said binder cover; and,

an annular flange formed on an outer surface of said body and extending circumferentially thereabout for spacing said ring metal a predetermined distance from said binder cover after said fastener is affixed to said binder cover for said ring metal to be positioned a desired distance from said binder cover.

15. The fastener of claim 14 wherein said body is closed at one end, said closed end forming a tapered, pointed end insertable through said binder cover,

16. The fastener of claim 15 wherein said outer surface of said body at said opposite end thereof has a recess formed therein forming a shoulder at a juncture between a first and larger outer diameter portion of said body and a second and smaller outer diameter end portion thereof, the diameter of said end portion of said body corresponding to the diameter of said opening for said ring metal to seat against said recess when said end portion of said body is inserted through said opening.

17. The fastener of claim 16 wherein said pointed end of said body is punched through said portion of said binder cover by a tool to a depth corresponding to the distance between said pointed end and said flange, said pointed end of said body further being flattened by said tool after penetrating through said portion of said binder cover to secure said fastener and ring metal in place.

18. The fastener of claim 14 wherein said outer surface of said body at each end thereof has a recess formed therein forming a shoulder at a juncture between a first and larger outer diameter portion of said body and a second and smaller outer diameter end portion thereof, the diameter of said end portion of said

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body at said one end thereof corresponding to the diameter of said opening in said ring metal for said ring metal to seat against said recess when said end portion of said one end of said body is inserted through said opening.

19. The fastener of claim 18 wherein said opposite end of said body is punched through said binder cover to a depth corresponding to the distance between said opposite end and said flange, said opposite end of said body further being flattened after being punched through said binder cover to secure said fastener and ring metal in place.

20. A fastener for securing a binder ring metal to a binder cover comprising:

a hollow, cylindrical body one end of which forms a tapered, pointed end insertable through said binder cover, an outer surface of said body at an opposite end thereof having a recess formed therein forming a shoulder at a juncture between a first and larger outer diameter portion of said body and a second and smaller outer diameter end portion thereof, the diameter of said end portion of said body corresponding to the diameter of an opening in said ring metal for said ring metal to seat against said recess when said opposite end of said body is inserted through said opening; and,

an annular flange formed on said outer surface of said body and extending circumferentially thereabout for spacing said ring metal a predetermined distance from said binder cover after said fastener is affixed to said binder cover so said ring metal is positioned a desired distance from said binder cover.

21. A fastener for securing a binder ring metal to a binder cover comprising:

a hollow, cylindrical body said outer surface of which, at each end thereof, has a recess formed therein forming a shoulder at a juncture between a first and larger outer diameter portion of said body and a second and smaller outer diameter end portion thereof, the diameter of said end portion of said body at one end thereof corresponding to the diameter of an opening in said ring metal for said

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ring metal to seat against said recess when said end portion of said one end of said body is inserted through said opening;

an annular flange integrally formed on said outer surface of said body and extending circumferentially thereabout for spacing said ring metal a predetermined distance from said binder cover after said fastener is affixed to said binder cover so said ring metal is positioned a desired distance from said binder cover; and,

an opposite end of said body being punched through said binder cover to a depth corresponding to the distance between said opposite end and said flange, said opposite end of said body further being flattened after punching through said binder cover to secure said fastener and ring metal to said binder cover.

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