June 17, 1952 J. B. O'CONNOR 2,601,125

REINFORCING CLIP

Filed Feb. 2, 1949

Fig. 1.

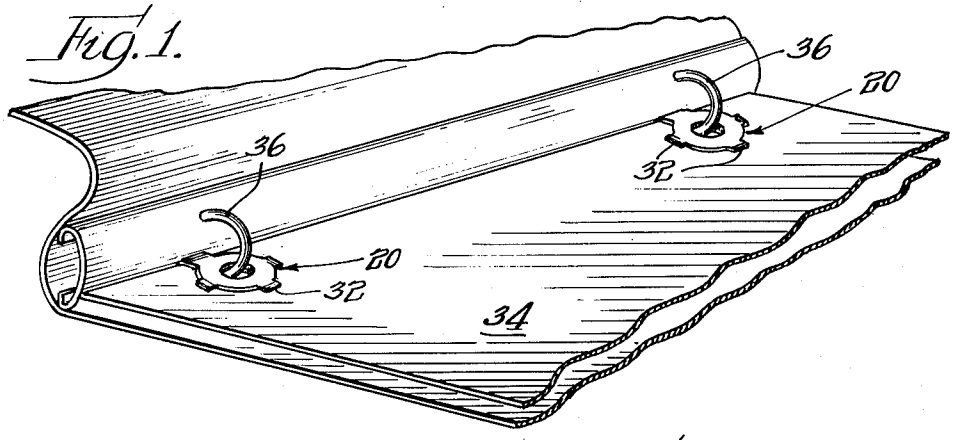


Fig. 2.

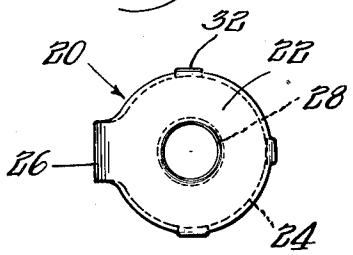


Fig. 4.

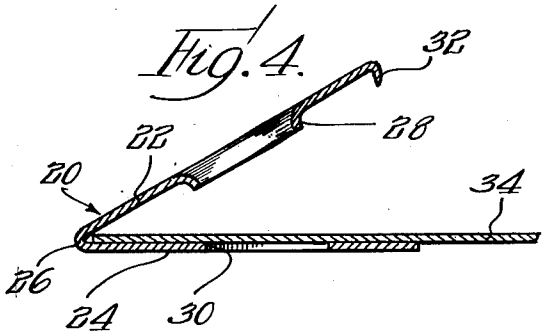


Fig. 3.

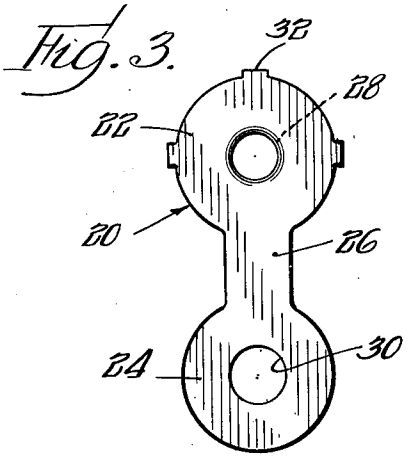


Fig. 5.

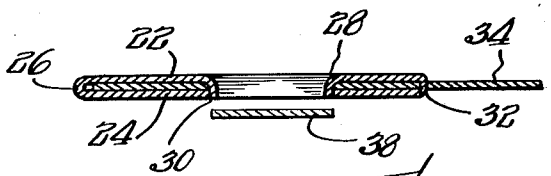
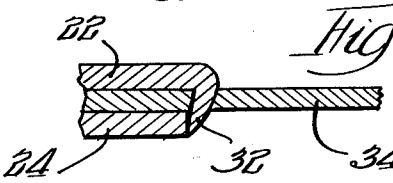


Fig. 6.



INVENTOR.

John B. O'Connor

BY

Moore, Olson & Trexler

Attys.

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2,601,125

REINFORCING CLIP

John B. O'Connor, Chicago, Ill., assignor to Illinois Tool Works, Chicago, Ill., a corporation of Illinois

Application February 2, 1949, Serial No. 74,137

1 Claim. (Cl. 129—1)

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This invention relates generally to means for reinforcing sheet material as, for example, sheets of a loose leaf binder, and more particularly to reinforcing elements especially designed to punch an aperture for accommodating a binder ring or post contemporaneously with the application of the reinforcing element to a binder sheet.

It has been common practice for many years to employ binder sheets having preformed apertures along one margin thereof for accommodating the ring or post of a binder. Efforts have heretofore been made to reinforce the material of the sheet in the vicinity of the aperture to counteract the tendency of wear and tear. In instances where perforations or binder holes are formed in a sheet just prior to insertion within a binder, it is the usual practice to employ a conventional punch. Then if the sheet material surrounding the aperture is to be reinforced, it is necessary to apply the reinforcing material after the punching operation has been completed. The present invention is primarily concerned with the provision of a reinforcing element of the type referred to above which is adapted upon application to a sheet to punch an aperture in the sheet. In other words, the invention contemplates elements capable of simultaneously punching a hole and thereafter reinforcing the material surrounding said hole.

More specifically, the invention contemplates a very simple one-piece element of the type referred to above, adapted to be stamped and formed from thin sheet metal stock, and to this end it is proposed to provide a pair of integrally connected annuli adapted when moved into clamping engagement with opposite sides of sheet material to punch an aperture and to provide a permanent reinforcement for the sheet stock.

It is a further object of the present invention to provide a combined punching and reinforcing element as outlined above, which makes it possible for the user to determine with accuracy and with ease the place along the margin of the sheet stock where an aperture is to be formed.

Still another object of the present invention is to provide a combined perforating and reinforcing element which, after it has performed the perforating operation, will automatically clamp itself in position on opposite sides of the sheet so as to insure against inadvertent or unauthorized detachment from the sheet.

These and other objects of the present invention will be best understood upon consideration of the following specification and the accompanying drawings in which:

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Figure 1 is a partial perspective view of a notebook binder in which the loose leaves therein have been equipped with reinforcing elements representing one embodiment of the present invention;

Figure 2 is a plan view of a reinforcing element made according to the present invention and which has been folded and snapped into position;

Figure 3 is a plan view of the reinforcing element of Figure 2 before application to a sheet of binder stock;

Figure 4 is an enlarged cross sectional view of the reinforcing element showing sheet material in position to be punched by the reinforcing element;

Figure 5 is an enlarged cross sectional view similar to Figure 4 showing the reinforcing element clamped in position on the sheet of material after punching a hole therein; and

Figure 6 is an enlarged fragmentary cross sectional view in the vicinity of a clamping prong of the reinforcing element of Figure 5.

A reinforcing element which is representative of one embodiment of the present invention is generally designated by the numeral **20** and comprises two leaf or plate-like portions **22** and **24**. As is best seen in Figure 3 these plates **22** and **24** are formed integral and are preferably joined by a bendable connecting portion **26**. The plate **22** has formed thereon an extruded punch portion **28**. This punch **28** is formed in the approximate geometric center of the plate **22** and is circular in shape. A punch receiving aperture **30** is provided in the plate **24**. The aperture **30** is shaped to correspond to the punch **28** and is so positioned in the plate **24** that when the plates **22** and **24** are pressed together the punch **28** will accurately register with the aperture **30** as seen in Figure 5. The depth of the punch **28** is such that when the plates **22—24** are pressed together the punch **28** does not extend beyond the plate **24**.

Paper engaging prongs **32** are provided on the periphery and extend laterally of the plate **22**. When the plates **22—24** are clamped upon a binder sheet **34** as shown in Figure 5, these prongs penetrate the sheet and thus prevent subsequent shifting of the reinforcing element. It will be noted that these prongs **32** also engage the periphery of the plate **24** so as to counteract any tendency for the plates **22** and **24** to separate. However the prongs do not extend beyond plate **24**. The manner in which the prongs **32** interlock with the paper and frictionally engage the periphery of the plate **24** is best seen in the enlarged

view Figure 6. Although the prongs **32** as illustrated are carried by the plate **22**, they could with equal facility be formed on the plate **24**.

When the reinforcing element **20** is to be applied, a sheet **34** is placed as shown in Figure 4 with a plate of the reinforcing element on either side thereof and with the edge of sheet **34** urged against the fold in the connecting portion **26**. The aperture **30** is positioned at the point through which it is desired that the ring **36** or similar binder element is to pass. Then the plate **22** is moved toward the plate **24** until it is in the position shown in Figure 5. During this operation the punch **28** cooperating with the periphery of the aperture **30** will cut and force out a portion **38** of the sheet **34**, thus forming an aperture in the sheet **34** to accommodate the ring **36**. The prongs **32** simultaneously interlock with the sheet **34** by being pressed through it and frictionally engage the periphery of the plate **24**. The frictional contact between prongs **32** and the plate **24** and between the punch **28** and the periphery of the aperture **30** will hold the plates **22** and **24** in the position shown in Figure 5.

From the foregoing it will be appreciated that the present invention provides a reinforcing element for binder sheets which is capable of simultaneously punching a hole and thereafter reinforcing the material surrounding the hole. This reinforcing element can be made from sheet stock such as thin gage aluminum or brass by well known and economical methods of fabrication. The extruded portion **28** provides a smooth bearing surface between the binding post and the reinforcing element. Also when the annular extension **28** is telescopically associated with aperture **30**, as shown in Figure 5, the sharp edges of the stock defining the aperture are covered by the extrusion.

Although a preferred embodiment of the present invention has been shown for purposes of illustration, it is to be understood that the invention contemplates other changes and variations without departing from the spirit and scope of the appended claim.

I claim:

In combination with sheet material to be reinforced around punched apertures along a marginal edge thereof, the provision of a reinforcing and punching element adapted for embracing application over the marginal edge of the sheet material and comprising a pair of plate members integrally connected by a readily bendable hinge portion exteriorly embracing the marginal edge of the sheet with the plate members extending inwardly therefrom and overlying opposite faces of the interposed sheet, one of said plate members having an aperture therethrough, the other of said plate members having a cylindrical opening defined by an annular flange extending toward the aperture in the other plate member and registering therewith when said plate members are compressed toward one another with the sheet material clamped therebetween for forcing the said annular flange through the registering aperture in the other plate member, whereby to punch and remove the sheet material within the flange and provide an unobstructed aperture therethrough for receiving a binder post or ring, and peripherally disposed projecting means on one of the plate members extending toward the other plate member for penetrating the sheet material therebetween and the said annular flange snugly fitting within the registering aperture to position the said projecting means for frictionally engaging the said other plate member for resisting tendency of the plate members to separate about the hinge portion from clamped position on the interposed sheet material.

JOHN B. O'CONNOR.

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