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Rall

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[45] Date of Patent: Mar. 18, 1997

[54] **MULTIPLE HOLE PATTERN PAPER PUNCH APPARATUS**

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[51] **Int. Cl.**[6] **B26F 1/02**

[52] **U.S. Cl.** **83/467.1**; 83/618; 83/633; 83/687

[58] **Field of Search** 83/948, 687, 618, 83/599, 167, 691, 467.1, 633

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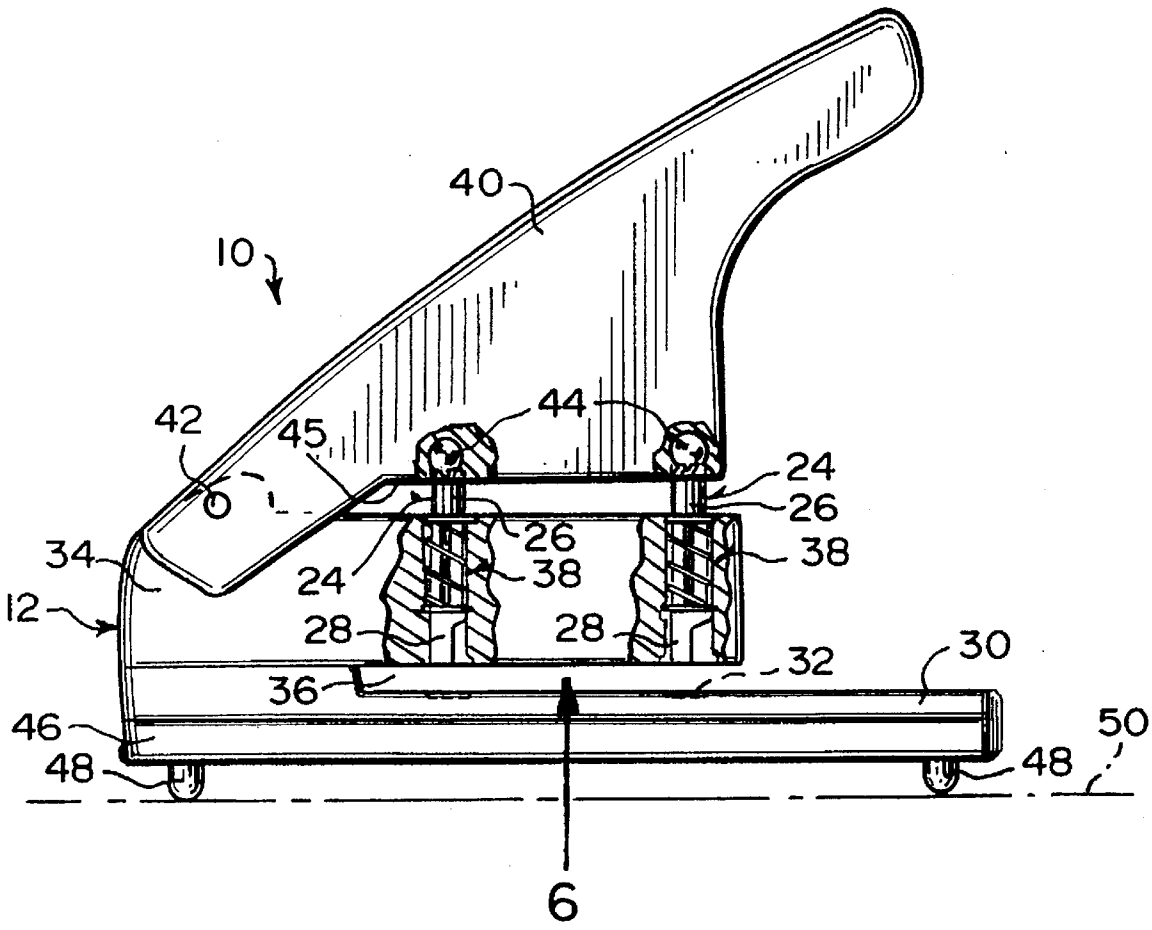
Primary Examiner—Kenneth E. Peterson
Attorney, Agent, or Firm—Michael I. Kroll

[57] **ABSTRACT**

A multiple hole pattern paper punch apparatus, comprising a structure for punching holes simultaneously at specific location points into a sheet, so as to form corner pockets in the sheet which will receive and maintain corners of a flat article retained thereto.

3 Claims, 6 Drawing Sheets



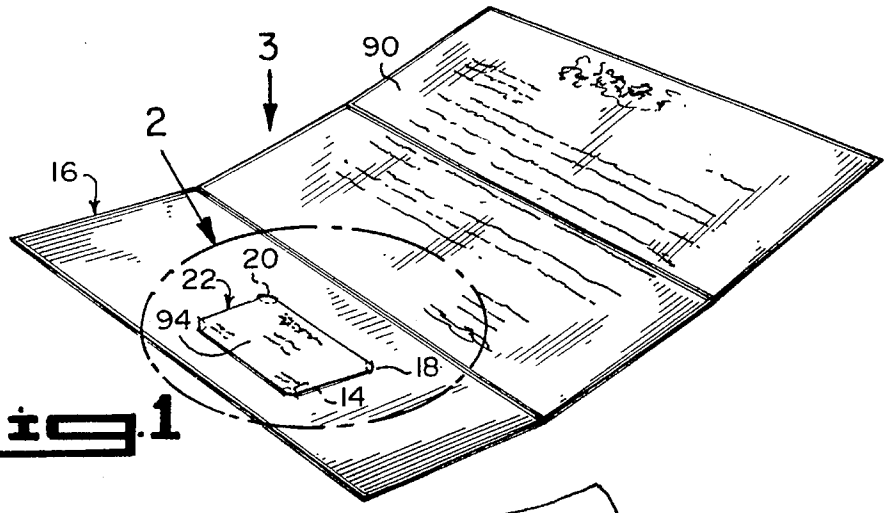


Fig. 1

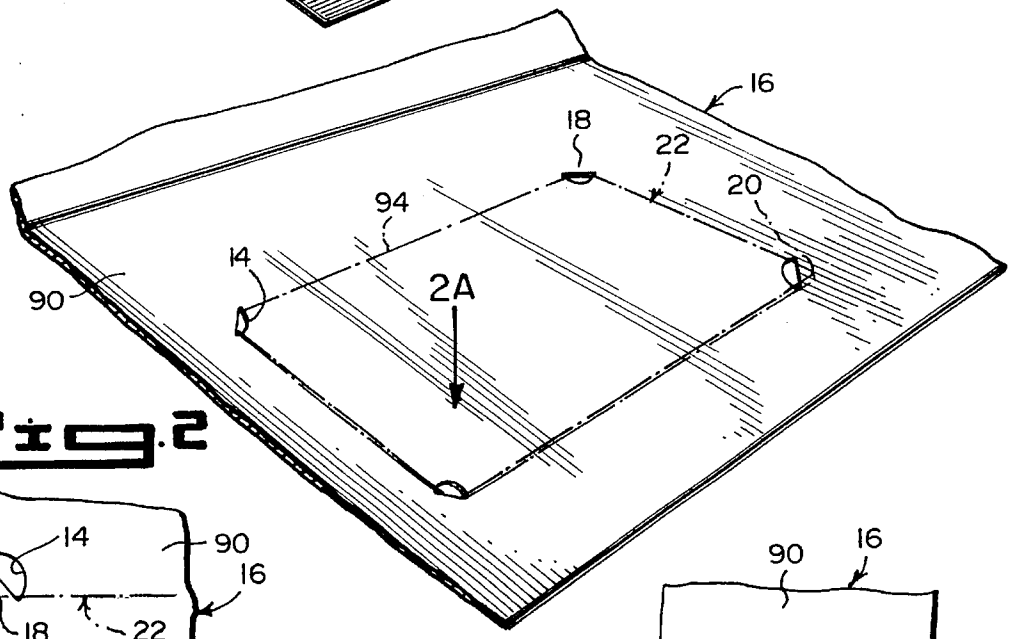


Fig. 2

Fig. 2A

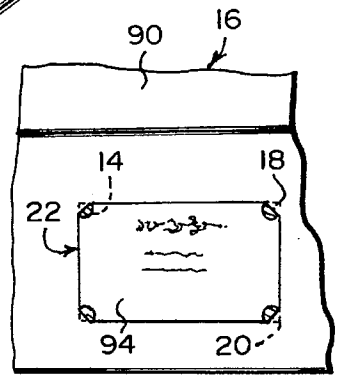


Fig. 3

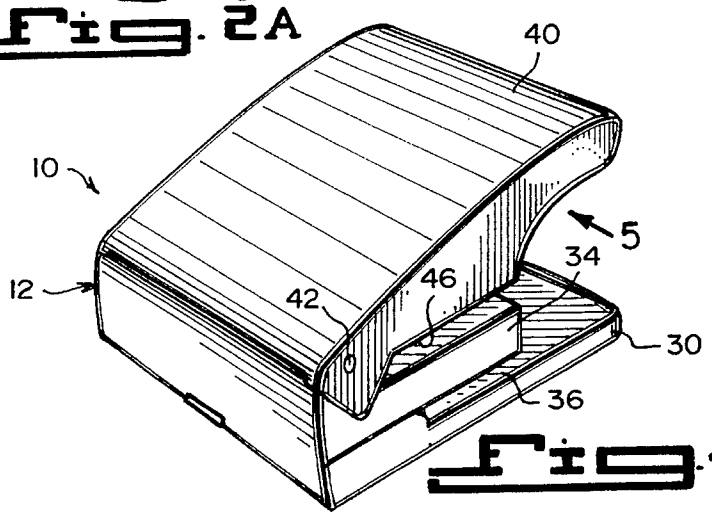


Fig. 4

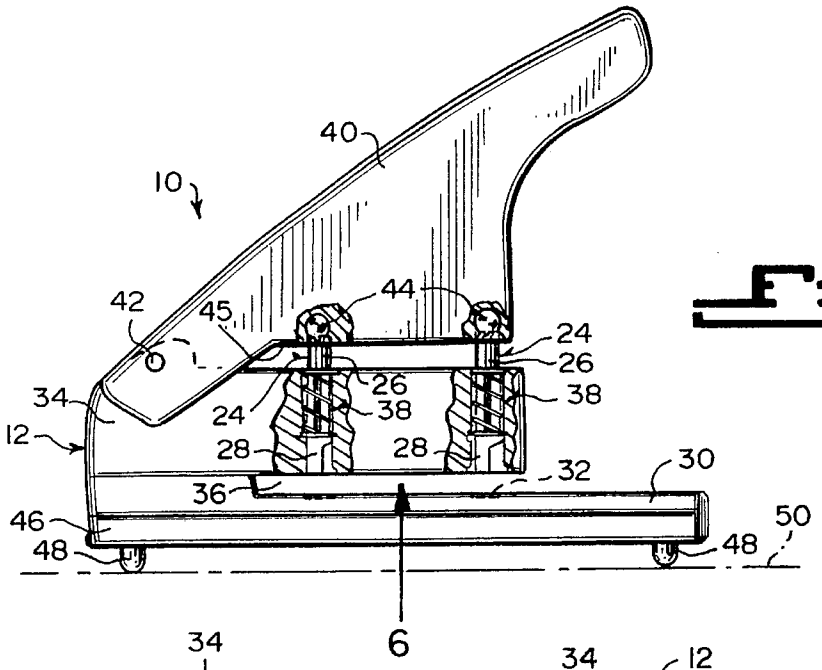


Fig. 5

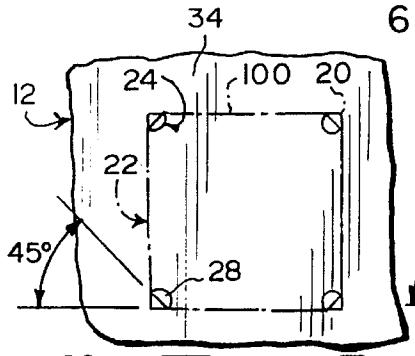


Fig. 6

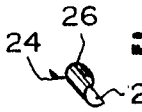


Fig. 6A

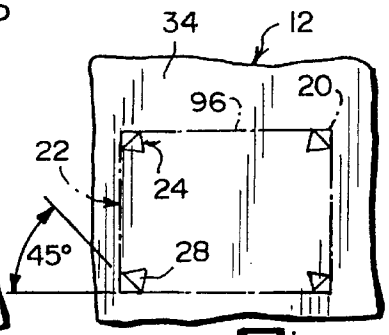


Fig. 7

Fig. 7A

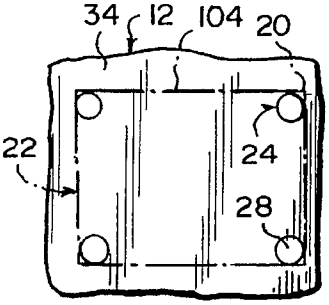


Fig. 8

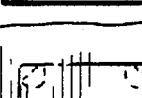


Fig. 8A

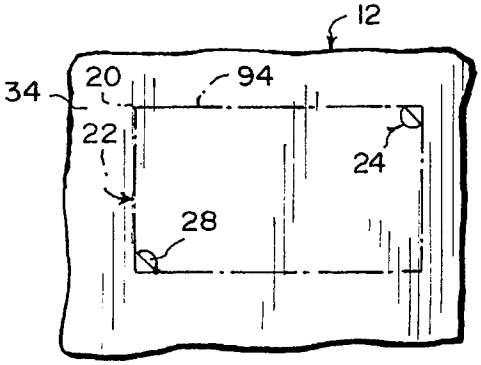


Fig. 9

Fig 10

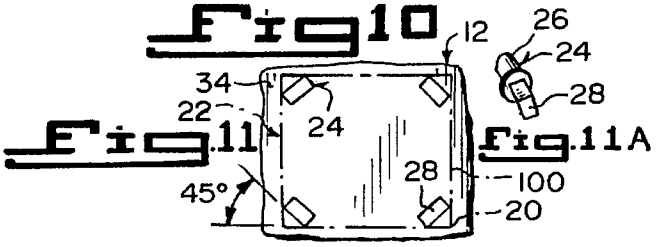


Fig. 11

Fig. 11A

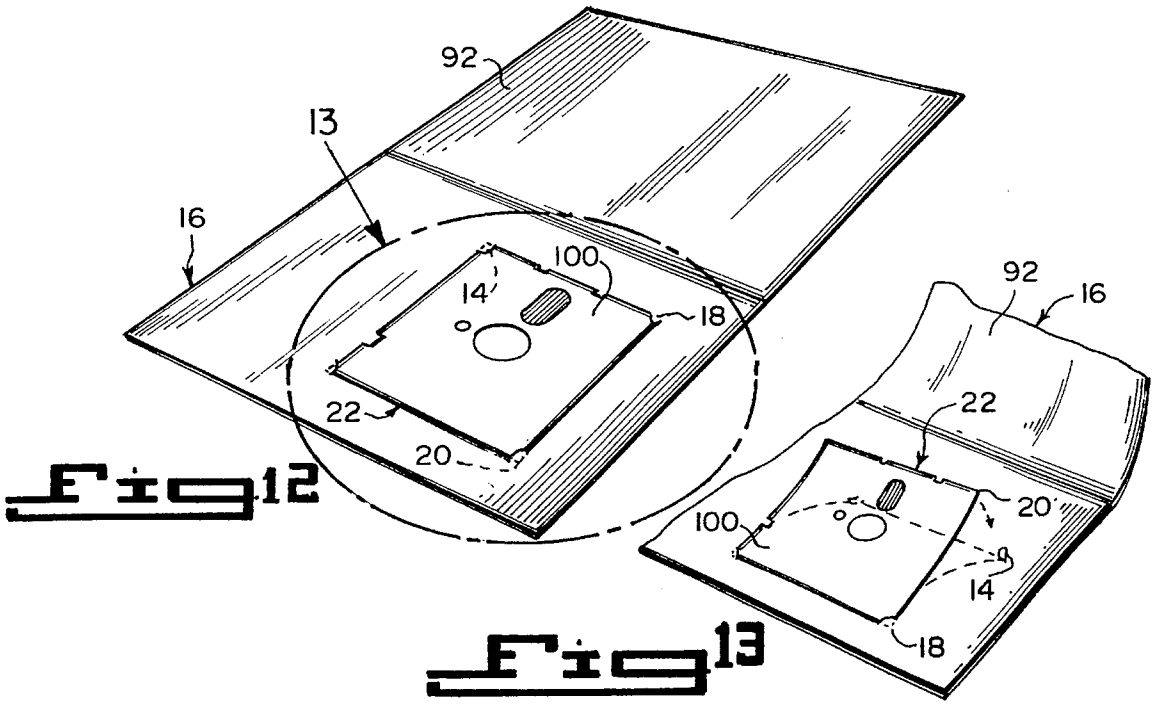


Fig 12

Fig 13

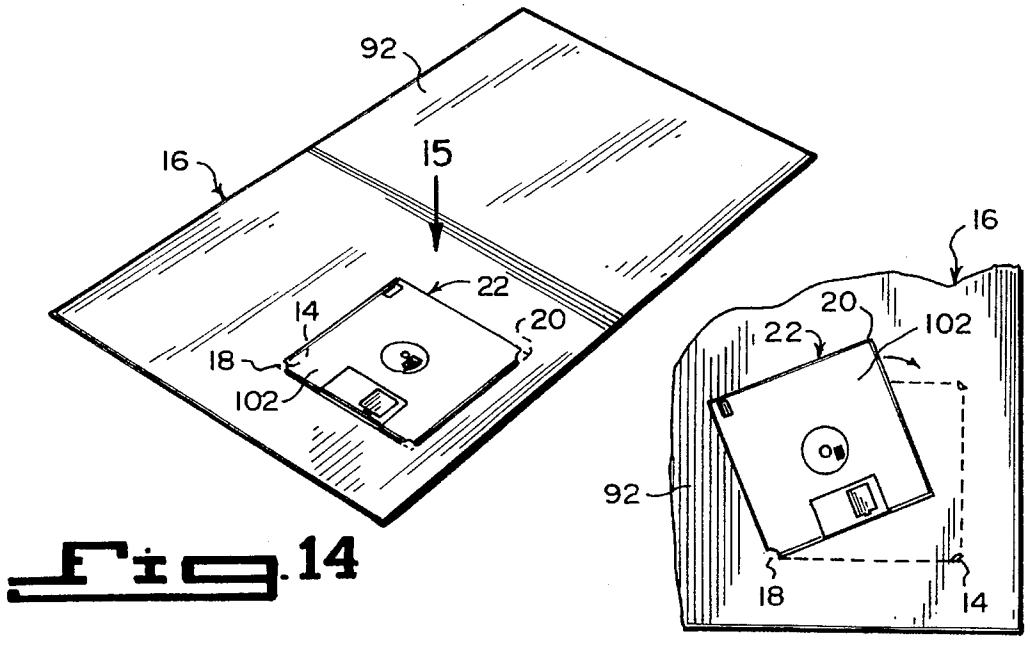


Fig 14

Fig 15

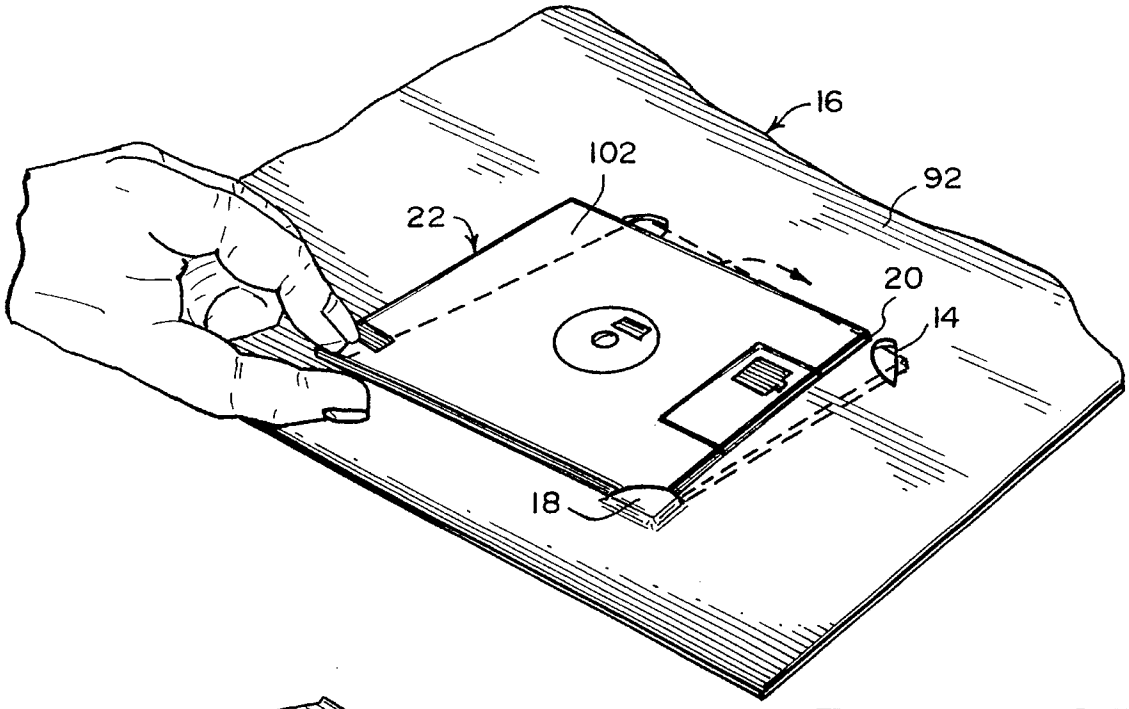


Fig. 16

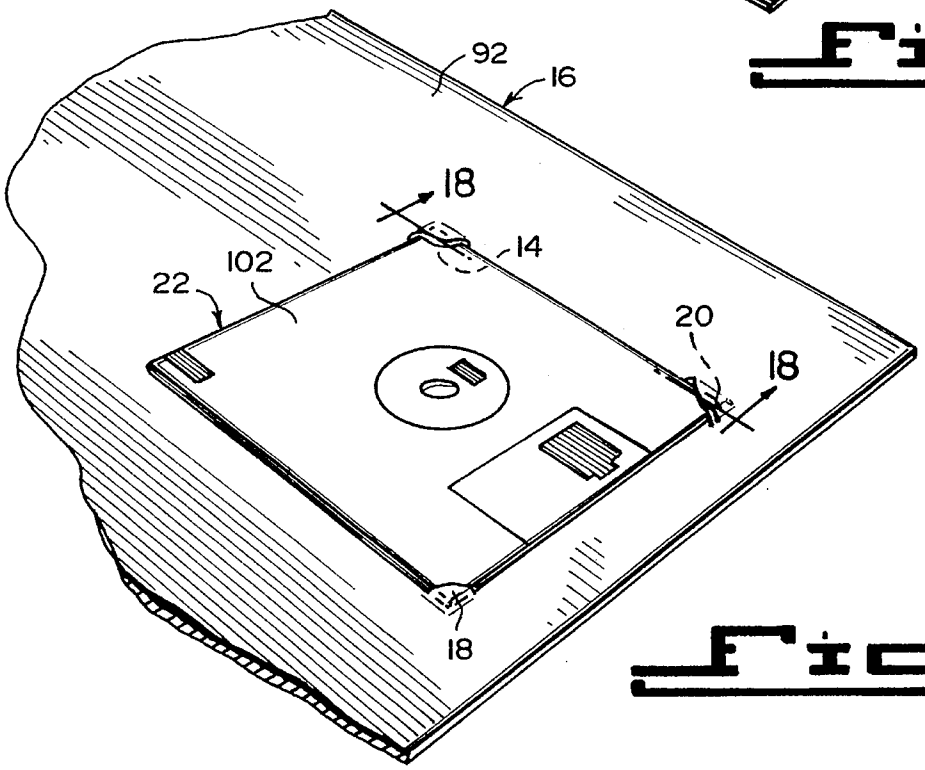


Fig. 17

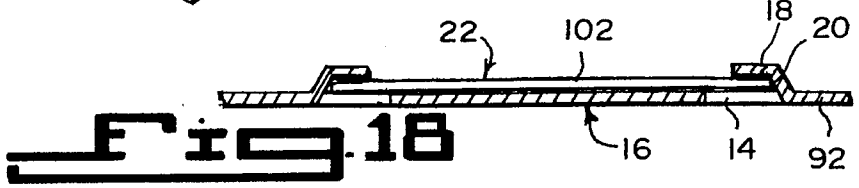


Fig. 18

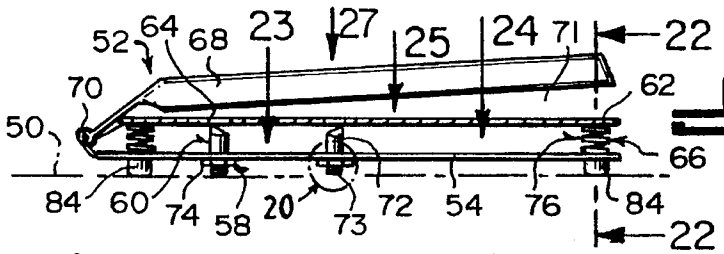


Fig. 19

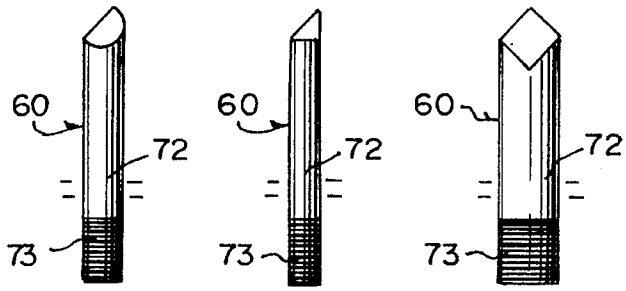


Fig. 21

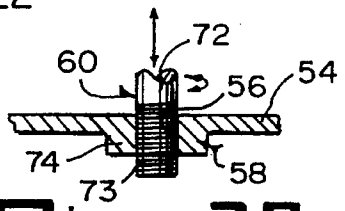


Fig. 20

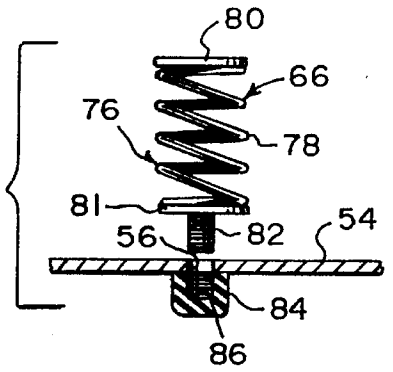


Fig. 22

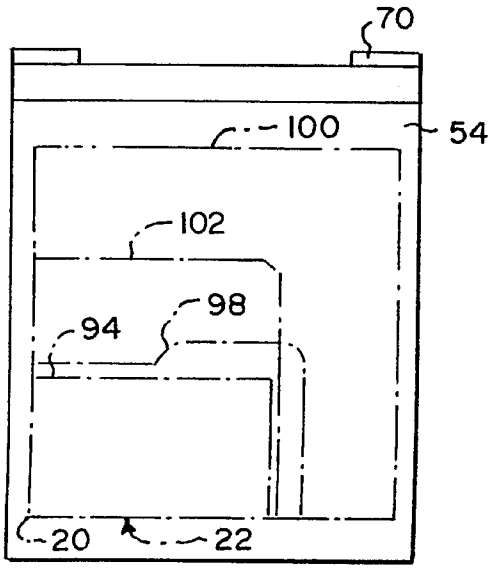


Fig. 23

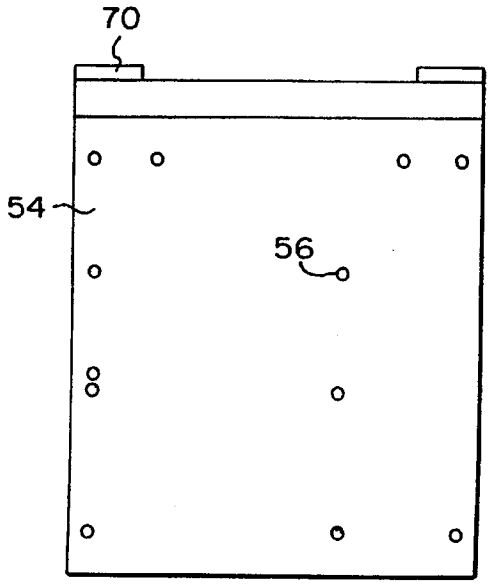


Fig. 24

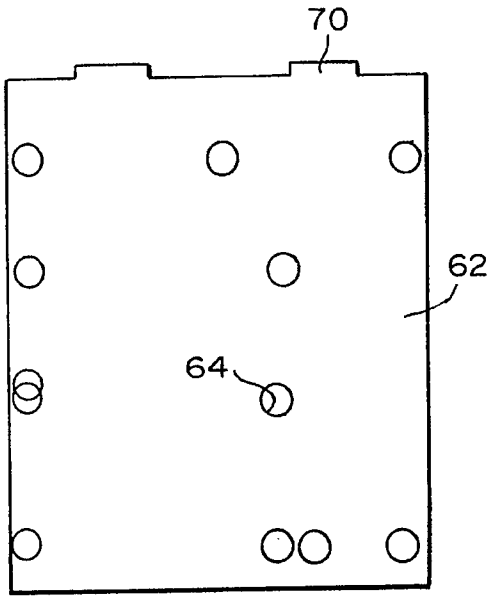


Fig. 25

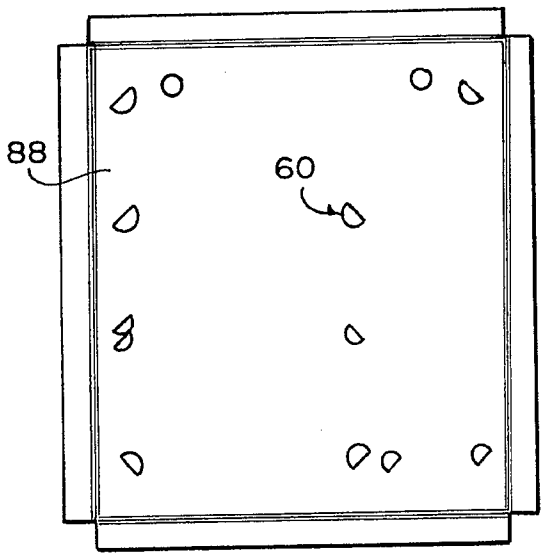


Fig. 26

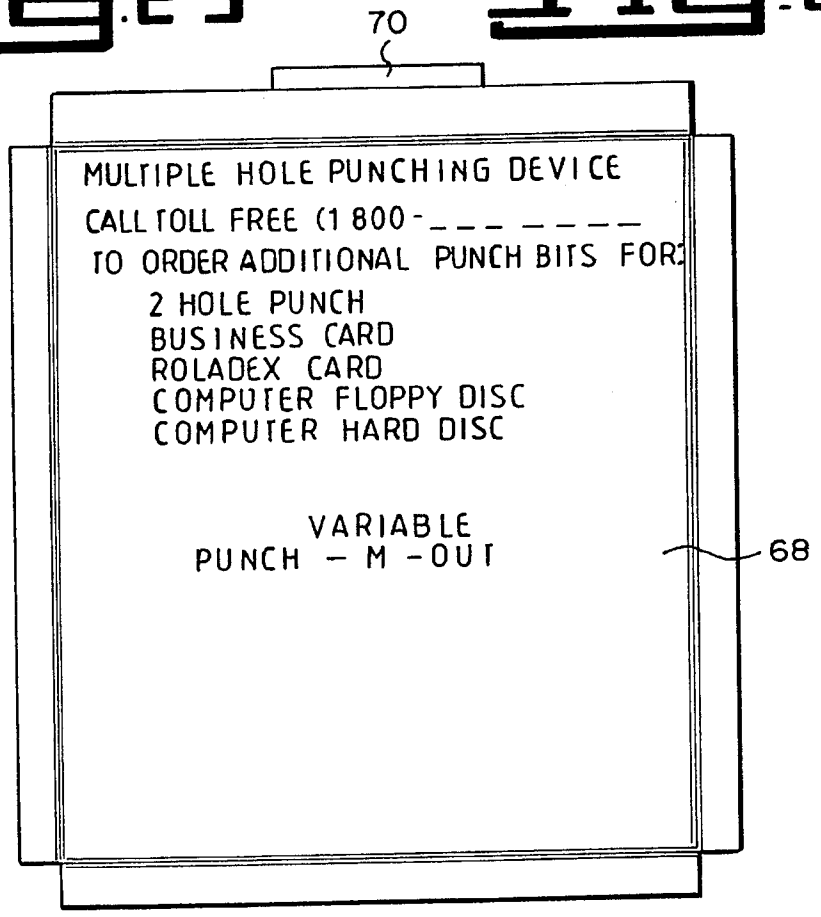


Fig. 27

MULTIPLE HOLE PATTERN PAPER PUNCH APPARATUS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The instant invention relates generally to paper punches and more specifically it relates to a multiple hole pattern paper punch apparatus.

2. Description of the Prior Art

Numerous paper punches have been provided in prior art. For example, U.S. Pat. Nos. 430,315 to House and 4,829,867 to Neilsen are illustrative of such prior art. While these units may be suitable for the particular purpose to which they address, they would not be as suitable for the purposes of the present invention as heretofore described.

HOUSE, JAMES ALFORD

PUNCH AND METHOD OF MAKING THE SAME

U.S. Pat. No. 430,315

A punch adapted for use in combination with a die. The punch consists of a folded or drawn sheet-metal portion adapted to enter the die. A shank has a socket flaring upwardly from its mouth and is adapted to contain the upper end of the cutting portion. A filling of fusible metal surrounds the cutting portion and holds the latter in proper position relative to the shank.

NEILSEN, HILDAUR L.

PAPER PUNCH APPARATUS WITH IMPROVED PUNCH ELEMENT

U.S. Pat. No. 4,829,867

A paper punch comprising a body defining a gap for insertion of the material to be punched and has at least one punch hole at the bottom of the gap. Guides are for guiding a punching element across the gap into the punch hole. At least one cylindrical punching element is disposed to be guided into the punch hole and has a cutting end with a cutting edge which extends helically along at least one-half of the circumference of the punching element. Preferably the punching element is hollow and is formed from a shaped sheet of metal.

SUMMARY OF THE INVENTION

A primary object of the present invention is to provide a multiple hole pattern paper punch apparatus that will overcome the shortcomings of the prior art devices.

Another object is to provide a multiple hole pattern paper punch apparatus that contains a plurality of hole punch bits at various location points, whereby when holes are punched out in a piece of paper or folder by the hole punch bits, corner pockets are formed to receive corners of a flat article, so that the flat article can be retained thereto.

An additional object is to provide a multiple hole pattern paper punch apparatus, in which the hole punch bits are adjustable with respect to the various location points, so that the apparatus can be adaptable to accommodate the insertion of the corners of the flat article into the corner pockets, whereby to flat article can be a business card, a Roladex card, a display card, a small hand computer disc, a large floppy computer disc, a photograph and any other similar article.

A further object is to provide a multiple hole pattern paper punch apparatus that is simple and easy to use.

A still further object is to provide a multiple hole pattern paper punch apparatus that is economical in cost to manufacture.

Further objects of the invention will appear as the description proceeds.

To the accomplishment of the above and related objects, this invention may be embodied in the form illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only, and that changes may be made in the specific construction illustrated and described within the scope of the appended claims.

BRIEF DESCRIPTION OF THE DRAWING FIGURES

Various other objects, features and attendant advantages of the present invention will become more fully appreciated as the same becomes better understood when considered in conjunction with the accompanying drawings, in which like reference characters designate the same or similar parts throughout the several views, and wherein:

FIG. **1** is a perspective view of a piece of paper showing four corners of a business card retained in place in four corner pockets formed by semicircular holes punched out by the instant invention.

FIG. **2** is an enlarged perspective view of a portion of the piece of paper as indicated by arrow **2** in FIG. **1**, showing the business card in phantom lines.

FIG. **2A** is an enlarged top view of a portion of the piece of paper taken in the direction of arrow **2A** in FIG. **2**, showing one of the corner pockets in greater detail.

FIG. **3** is a top view of a portion of the piece of paper taken in the direction of arrow **3** in FIG. **1**, showing the business card retained in place.

FIG. **4** is a perspective view of a first embodiment of the instant invention.

FIG. **5** is a side view taken in the direction of arrow **5** in FIG. **4**, with parts broken away and in section.

FIG. **6** is a diagrammatic bottom view of a portion of the guide housing, taken in the direction of arrow **6** in FIG. **5**, with a four corner arrangement of semicircular hole punch bits for a large floppy computer disc that is shown in phantom lines.

FIG. **6A** is a perspective view of a tip end of one semicircular hole punch bit in FIG. **6**.

FIG. **7** is a diagrammatic bottom view of a portion of the guide housing, similar to FIG. **6**, with a four corner arrangement of triangular hole punch bits for the business card that is shown in phantom lines.

FIG. **7A** is a perspective view of a tip end of one triangular hole punch bit in FIG. **7**.

FIG. **8** is a diagrammatic bottom view of a portion of the guide housing, similar to FIG. **7**, with a four corner arrangement of circular hole punch bits for a photograph that is shown in phantom lines.

FIG. **8A** is a perspective view of a tip end of one circular hole punch bit in FIG. **8**.

FIG. **9** is a diagrammatic bottom view of a portion of the guide housing, similar to FIG. **8**, with a two diagonal corner arrangement of the semicircular hole punch bits for the business card that is shown in phantom lines.

FIG. **10** is a diagrammatic bottom view of a portion of the guide housing, similar to FIG. **9**, with a multi-corner

arrangement of semicircular hole punch bits for a Roladex card that is shown in phantom lines.

FIG. **11** is a diagrammatic bottom view of a portion of the guide housing, similar to FIG. **10**, with a four corner arrangement of rectangular hole punch bits for the large floppy computer disc that is shown in phantom lines.

FIG. **11A** is a perspective view of a tip end of one rectangular hole punch bit in FIG. **11**.

FIG. **12** is a perspective view of a folder showing four corners of the large floppy computer disc retained in place in four corner pockets formed by semicircular holes punched out by the instant invention.

FIG. **13** is a perspective view of a portion of the folder as indicated by arrow **13** in FIG. **12**, showing the large floppy computer disc being installed.

FIG. **14** is a perspective view of a folder, showing three corners of a small hard computer disc retained in place in three corner pockets formed by semicircular holes punched out by the instant invention.

FIG. **15** is a top view of a portion of the folder taken in the direction of arrow **15** in FIG. **14**, showing the small hard computer disc ready to be installed.

FIG. **16** is a perspective view of a portion of the folder, showing the small hard computer disc being installed.

FIG. **17** is a perspective view of a portion of the folder, showing the small hard computer disc completely installed and retained in place.

FIG. **18** is a cross sectional view taken along line **18—18** in FIG. **17**.

FIG. **19** is a side view of a second embodiment of the instant invention, with parts in section.

FIG. **20** is an enlarged cross sectional view taken in the area indicated by arrow **20** in FIG. **19**.

FIG. **21** is an elevational view showing three different types of hole punch bits.

FIG. **22** is an enlarged partly exploded cross sectional view taken along line **22—22** in FIG. **19**.

FIG. **23** is a diagrammatic top view of the base plate taken in the direction of arrow **23** in FIG. **19**, showing an overlay pattern in phantom lines of some of the various flat articles that can be retained to the piece of paper or folder.

FIG. **24** is a diagrammatic top view of the base plate taken in the direction of arrow **24** in FIG. **19**, showing various location points of the hole punch bits to accommodate the various flat articles shown in FIG. **23**.

FIG. **25** is a diagrammatic top view of the floating plate taken in the direction of arrow **25** in FIG. **19**, showing clearance apertures for the hole punch bits to pass through.

FIG. **26** is a diagrammatic flattened out top view of a combination scrap receptacle and punch bit die, which can be mounted in a removable manner onto a press handle of the second embodiment.

FIG. **27** is a diagrammatic flattened top view of the press handle as indicated by arrow **27** in FIG. **19**.

Similar reference characters denote corresponding features consistently throughout the attached drawings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Turning now descriptively to the drawings, in which similar reference characters denote similar elements throughout the several views, FIGS. **1** through **18** illustrate a multiple hole pattern paper punch apparatus **10**, comprising a structure **12** for punching holes **14** simultaneously at specific location points into a sheet **16**, so as to form corner pockets **18** in the sheet **16** which will receive and maintain corners **20** of a flat article **22** retained thereto.

The hole punching structure **12** includes a plurality of hole punch bits **24**. Each hole punch bit **24** consists of an elongated shank portion **26** and a cutting tip end **28** on the elongated shank portion **26**. The cutting tip end **28** is of a particular geometric configuration.

The multiple hole pattern paper punch apparatus **10**, further contains a base plate **30** having a plurality of apertures **32** at the specific location points. A guide housing **34** is attached at one end to the base plate **30**, so as to form a gap **36** therebetween for insertion of the sheet **16** therein. Assemblies **38** in the guide housing **34**, is for directing the hole punch bits **24** across the gap **36** into the apertures **32**. A handle **40** is hinged at one end **42** to the guide housing **34**. A plurality of punch press members **44** are in a bottom surface **45** of the handle **40**. When the handle **40** is pressed down, the punch press members **44** will drive the hole punch bits **24** through the directing assemblies **38** in the guide housing **34**, to punch holes **14** simultaneously at the specific location points into the sheet **16**.

A catch basin **46** can be mounted in a removable manner to the underside of the base plate **30**, so as to capture all small particles of the sheet **16** after holes **14** are punched out. A plurality of rubber feet **48** are affixed to the underside of the catch basin **46**, to stabilize the apparatus **10** upon a flat surface **50**.

An alternate multiple hole pattern paper punch apparatus **52** is shown in FIGS. **19** through **27** and includes a base plate **54** having a plurality of apertures **56** at a variety of specific location points. Units **58** are for mounting hole punch bits **60** into the apertures **56** in the base plate **54** in a variety of combinations, so that the hole punch bits **60** will extend upwardly therefrom. A float platform **62** has a plurality of clearance openings **64** in the same array as the apertures **56** in the base plate **54**. Components **66** are for supporting the float platform **62** in a spring biased manner over the base plate **54**. The clearance openings **64** are located directly above all of the apertures **56** in the base plate **54**, to allow the hole punch bits **60** in the base plate **54** to pass therethrough. A press handle **68** is hinged at one side **70** to the float platform **62** and the base plate **54**, so that there will be a gap **71** between the float platform **62** and the press handle **68** for insertion of the sheet **16** therein. When the press handle **68** is pressed down, the float platform **62** with the sheet **16** will move down. The hole punch bits **60** will punch holes **14** simultaneously at the specific location points into the sheet **16**.

The mounting units **58** consist of each shank portion **72** of each hole punch bit **60** threaded at a lower end **73**. A plurality of lock nuts **74** are provided. Each lock nut **74** is affixed to the underside of the base plate **54** directly below one aperture **56**. The threaded lower end **73** of the shank portion **72** of each hole punch bit **60** can be threaded therein to each lock nut **74**.

The supporting components **66** are four spring assemblies **76**, each of which is mounted at one corner of the base plate **54** and under one corner of the float platform **62**. Each spring assembly **76** contains a compressible spring **78**. A pair of washers **80** and **81** are provided, with each affixed to an opposite end of the spring **78**. A threaded stub shaft **82** extends downwardly from the lower washer **81** and through one aperture **56** in a corner of the base plate plate **54**. A

rubber pad **84** has a threaded bore **86**, to engage with the threaded stub shaft **82** under the base plate **54**. The rubber pads **84** will stabilize the apparatus **52** upon a flat surface **50**.

FIG. **26** shows a combination scrap receptacle and punch bit die **88**, which can be affixed in a removable manner directly onto the press handle **68**. The hole punch bits **60** are mounted directly onto the base plate **54**. All small particles of the sheet **16** will be captured after holes **14** are punched out.

The sheet **16** can be a piece of paper **90**, as shown in FIGS. **1** through **3**. The sheet **16** can also be a folder **92**, as shown in FIGS. **12** through **18**.

As best seen in FIG. **6**, the geometric configuration of the cutting tip end **28** of the hole punch bit **24** can be semicircular with its straight side positioned approximately at a forty five degree angle with respect to the corner **20** of the flat article **22**. As best been in FIG. **7**, the geometric configuration of the cutting tip end **28** of the hole punch bit **24** can be triangular with one straight side positioned approximately at a forty five degree angle with respect to the corner **20** of the flat article **22**. As best seen in FIG. **8**, the geometric configuration of the cutting tip end **28** of the hole punch bit **24** is circular and is positioned tangent to two sides of the corner **20** of the flat article **22**. As best seen in FIG. **11**, the geometric configuration of the cutting tip end **28** of the hole punch bit **24** is rectangular with one long straight side positioned approximately at a forty five degree angle with respect to the corner **20** of the flat article **22**.

The flat article **22** can be a business card **94** as shown in FIGS. **1** through **3**, **9** and **23**, a display card **96** as shown in FIG. **7**, a Roladex card **98** as shown in FIGS. **10** and **23**, a large floppy computer disc **100** as shown in FIGS. **6**, **11** through **13** and **23**, a small hard computer disc **102** as shown in FIGS. **14** through **18** and **23**, a photograph **104** as shown in FIG. **8**, or any other similar flat article.

The apparatus **52** can be modified in that it can be flipped over, which would result in the hole punch bits **60** coming down from the press handle **68**. Eliminate the float platform **68** and have the combination scrap receptacle and punch bit die **88** serve as the base plate **54**. Also, there can be a further modification of the way the hole punch bits **60** are actually mounted.

LIST OF REFERENCE NUMBERS

10 multiple hole pattern paper punch apparatus
12 hole punching structure of **10**
14 hole in **16**
16 sheet
18 corner pocket in **16**
20 corner of **22**
22 flat article
24 hole punch bits in **12**
26 elongated shank portion of **24**
28 cutting tip end of **24**
30 base plate of **10**
32 aperture in **30**
34 guide housing of **10**
36 gap between **30** and **34**
38 directing assembly in **34**
40 handle of **10**
42 hinge between **34** and **40**
44 punch press pin in **40**
45 bottom surface of **40**
46 catch basin on **30**
48 rubber foot on **46**
50 flat surface
52 alternate multiple hole pattern paper punch apparatus
54 base plate of **52**
56 aperture in **54**
58 mounting unit for **60**
60 hole punch bit
62 float platform of **52**
64 clearance opening in **62**
66 supporting component for **62**
68 press handle of **52**
70 hinge between **54**, **62** and **68**
71 gap between **62** and **68**
72 shank portion of **60**
73 threaded lower end of **72**
74 lock nut on **54** under **56**
76 spring assembly for **66**
78 compressible spring of **76**
80 upper washer on **78**
81 lower washer on **78**
82 threaded stub shaft on **81**
84 rubber pad
86 threaded bore in **84**
88 combination scrap receptacle and punch bit die on **68**
90 piece of paper for **16**
92 folder for **16**
94 business card for **22**
96 display card for **22**
98 Roladex card for **22**
100 large floppy computer disc for **22**
102 small hard computer disc for **22**
104 photograph for **22**

It will be understood that each of the elements described above, or two or more together may also find a useful application in other types of methods differing from the type described above.

While certain novel features of this invention have been shown and described and are pointed out in the annexed claims, it is not intended to be limited to the details above, since it will be understood that various omissions, modifications, substitutions and changes in the forms and details of the device illustrated and in its operation can be made by those skilled in the art without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can, by applying current knowledge, readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention.

What is claimed is new and desired to be protected by Letters Patent is set forth in the appended claims:

1. A multiple hole pattern paper punch apparatus for punching holes simultaneously at specific location points into a sheet, so as to form corner pockets in said sheet which will receive and maintain corners of a flat article retained thereto comprising:

a) base plate means having a plurality of apertures at specific location points corresponding to the corners of said flat article to be retained;

b) guide housing means attached at one end to said base plate forming a gap with a lateral sheet abutment between said housing and said base plate, means for insertion of a sheet therein in which holes in a predetermined pattern are to be punched corresponding to the corners of said flat article;

c) a plurality of hole punch bits mounted within said guide housing and aligned with said apertures in said base

plate means, each of said hole punch bits consisting of an elongated shank portion and a cutting tip end designed to cut out a piece of said sheet having a specific geometric configuration;

d) handle means hinged at one end to said guide housing means having mounted in a bottom surface thereof a plurality of press members aligned with all of said hole punch bits so that when said handle means is pressed down said press members to drive all of said hole punch bits out through said base plate means through said gap to punch holes simultaneously at said specific location points through said sheet; and

e) at least one said plurality of punch bits being spaced further from said abutment than another of said plurality of punch bits and said base plate means having at least three different apertures at at least three different distances from said abutment.

2. A multiple hole pattern paper punch apparatus as recited in claim **1**, wherein said sheet is a piece of paper.

3. A multiple hole pattern paper punch as recited in claim **1**, wherein said sheet is a folder.

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