Oct. 25, 1960 C. SPONSEL 2,957,218

PAPER CLIP

Filed Dec. 16, 1957 3 Sheets-Sheet 1

Fig. 1

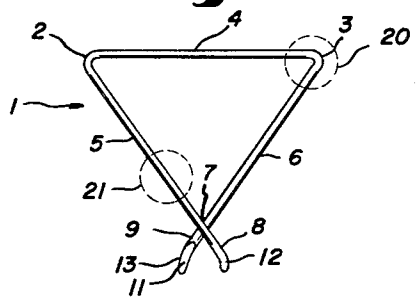


Fig. 2

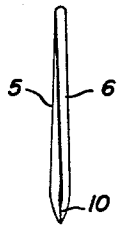


Fig. 3

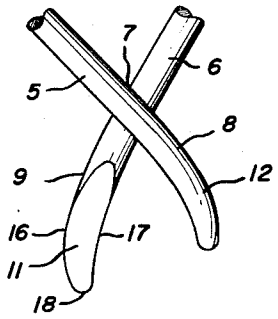


Fig. 4

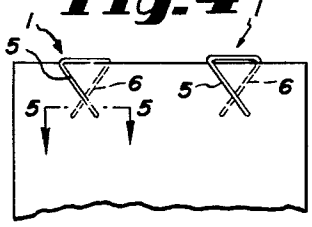


Fig. 5

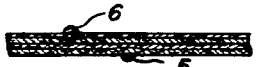


Fig. 6



Fig. 8



Fig. 7

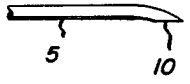


Fig. 9

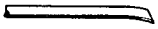


Fig. 10

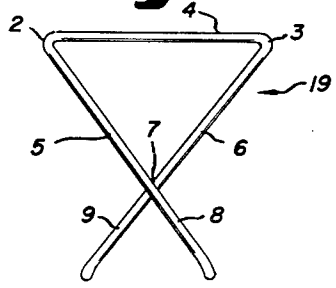
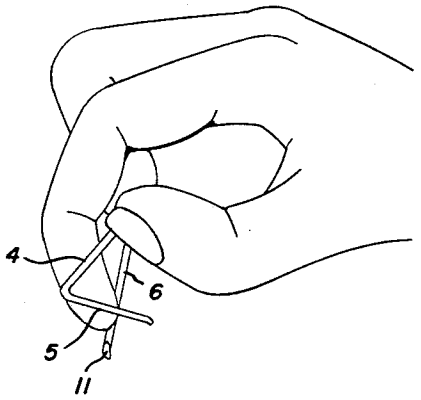


Fig. 11



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Fig.12

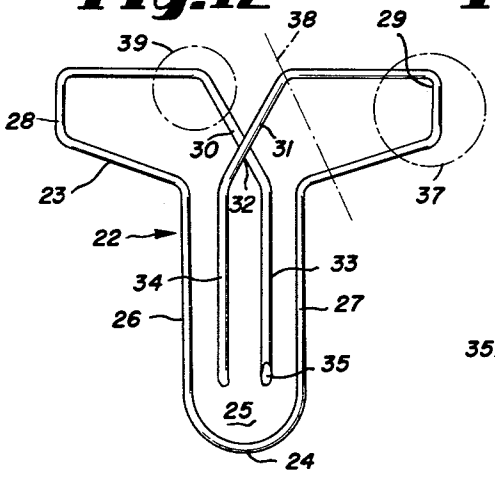


Fig.13

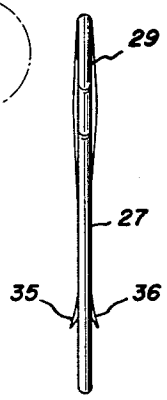


Fig.14

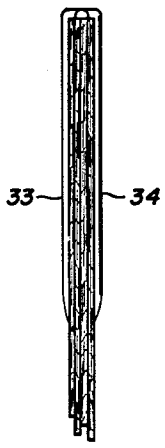


Fig.16

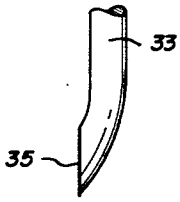


Fig.15

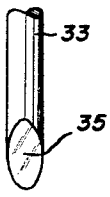


Fig.19

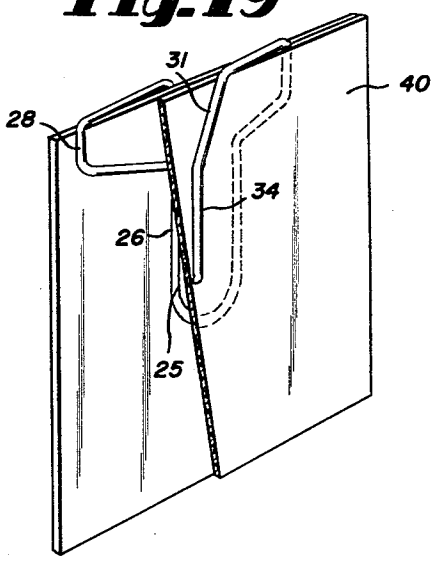


Fig.18

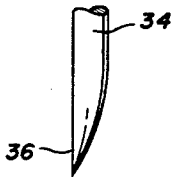


Fig.17

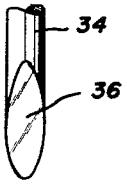
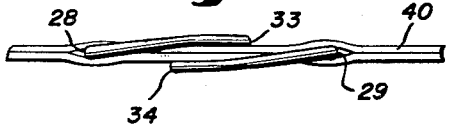


Fig.20



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Fig. 21

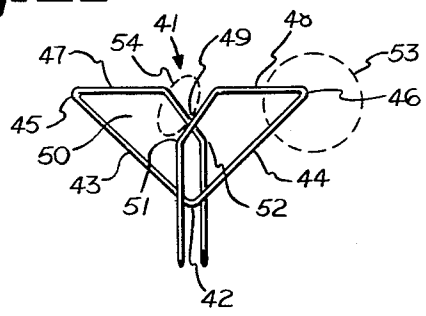


Fig. 22

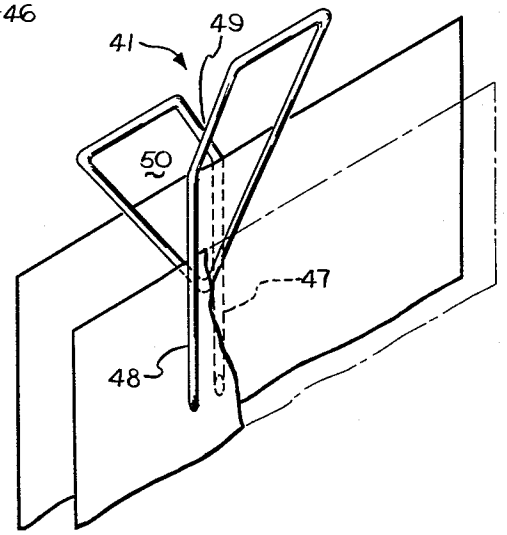


Fig. 23

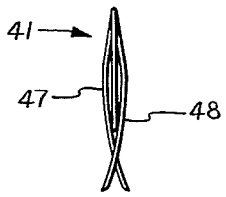


Fig. 24

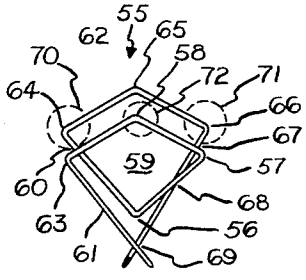


Fig. 25

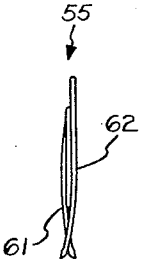


Fig. 26

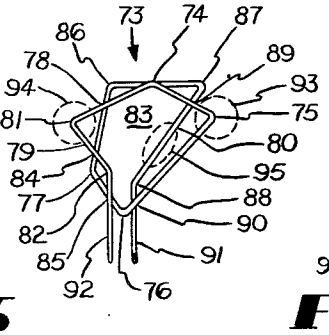
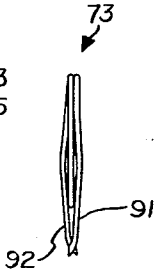


Fig. 27



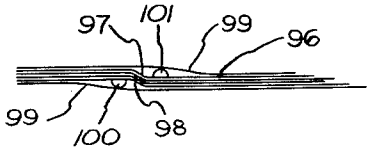


Fig. 28

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United States Patent Office

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2,957,218

PAPER CLIP

Charles Sponsel, 408 Keleher NW., Albuquerque, N. Mex.

Filed Dec. 16, 1957, Ser. No. 703,094

5 Claims. (Cl. 24—66)

The present invention relates to clips for retaining sheet material, more particularly, to a clip formed from a strip of resilient stock and having gripping surfaces on the ends of the legs of the clip so that only the gripping surfaces press against the sheet material but do not damage or puncture the sheet material in any way while retaining the material in the clip.

Many forms of paper clips from a strip of resilient stock have been previously devised. In these clips sheet materials are conventionally retained between two resilient legs. Usually the entire length of the leg presses against the sheet material so as to retain the sheet material in position. In some cases, however, the ends of the legs have been modified so as to retain the sheet material in place. This usually has comprised grinding the ends of the legs so as to form a sharp point thereon. The sharp point then digs into the outer surface of the sheet material so as to prevent relative movement between the sheet material and the clip. This method, however, has a disadvantage in that it will mar the outer surface of the sheet material. In addition, the ends of the legs are so formed that they will catch loose sheets of paper which come in contact with the sheet material in the clip. These loose or extra sheets of paper will not slide easily over the ends of the clip but will be caught thereby and in some cases may be damaged.

The present invention eliminates the disadvantage of paper clips as pointed out and provides a clip wherein the gripping action is obtained on a gripping area which is located at the ends of the legs. The ends of the legs surrounding the gripping area are finished in such a way that the ends of the legs will not catch any loose extra sheets of paper. Any loose sheets of paper will slide easily over the ends of the clip and will not become damaged thereby in a manner as happens too often with previous clips.

In accordance with this invention, a clip is formed from a single strip of resilient stock and bent in such a manner that the legs cross each other. The ends of the legs are formed into gripping surfaces by first bending the ends of the legs and then grinding off the bent portion so as to form a flat gripping surface. The entire clip is so formed that it may be easily opened by the fingers of one hand to enable sheet material to be inserted between the legs.

A further modification of this clip is also disclosed wherein sheet material may be retained between the main portion of the clip and at least one of the legs. This type of clip lends itself to use when large quantities of sheet material are desired to be secured together. The main portion of the clip may be inserted into the center of the sheet material with the legs of the clip being positioned against the outer ones of the sheet material. Consequently, this clip will secure the sheet material by retaining the material between the main portion and one of the legs.

It is therefore the principal object of this invention to provide a clip for sheet material formed from a resilient strip which will have an effective gripping action on the sheet material without damaging the same.

It is another object of this invention to provide a clip for sheet material of the type where sheet material is retained between two legs and having a novel structure on the end of the leg so as to grip effectively the sheet material.

It is a further object of this invention to provide a clip of resilient material which retains sheet material between legs but which may be easily opened merely by finger pressure.

It is an additional object of this invention to provide a clip for sheet material the ends of which will not catch any loose papers when the clip is in position.

It is still another object of this invention to provide a clip for sheet material having gripping surfaces which will readily slide on the sheet material retained in the clip without damaging this material in any way.

It is still an additional object of this invention to provide a clip of resilient material which is easily operable.

The invention will become better understood and additional objects and advantages will become apparent when reference is made to the accompanying description and the following drawings wherein:

Figure 1 is a plan view of the clip of this invention;

Figure 2 is a side view of the clip illustrated in Figure 1;

Figure 3 is a perspective view showing the ends of the clip illustrated in Figures 1 and 2 in enlarged scale;

Figure 4 is a plan view illustrating the manner in which sheet material is retained between the legs of the clip illustrated in Figure 1;

Figure 5 is a sectional view taken across the line 5—5 of Figure 4;

Figure 6 is a side view of the end of a leg of a clip such as illustrated in Figure 1 showing the first step in forming the gripping surface on the end of the leg;

Figure 7 is a view similar to that of Figure 6 and showing the gripping surface after the grinding step;

Figures 8 and 9 illustrate a second method of forming the ends of the legs of the clip wherein Figure 8 discloses the first step of bending the end of the leg and Figure 9 discloses the second step of grinding the bent end of the leg;

Figure 10 is a plan view of a clip similar to that illustrated in Figure 1 illustrating the manner in which the clip is held in order to separate the legs to permit the insertion of sheet material between the legs;

Figure 12 is a plan view of a modification of the clip illustrated in Figure 1;

Figure 13 is a side view of the clip modification shown in Figure 12;

Figure 14 is a side view of the clip illustrated in Figures 12 and 13 and showing sheet material retained between the reverse bend portion and the legs;

Figure 15 is a front view in enlarged scale of one of the ends of the legs of the clip shown in Figure 12 illustrating the extent of the gripping surface;

Figure 16 is a side view of the leg illustrated in Figure 15;

Figure 17 is a front view of the other of the ends of the legs of the clip shown in Figure 12 and illustrating that the gripping area on this leg is larger than the gripping area on the legs illustrated in Figures 15 and 16;

Figure 18 is a side view of the end of the leg illustrated in Fig. 17;

Figure 19 is a perspective view illustrating the clip of Figure 12 as it is used in retaining sheet material;

Figure 20 is a top view of the clip and sheet material as illustrated in Figure 19;

Figure 21 is a plane view of another modification of the paper clip illustrated in Figure 1;

Figure 22 is a perspective view of the clip modification shown in Figure 21 and further showing the clip as it receives sheets of paper between the gripping surfaces thereof;

Figure 23 is a side elevational view of the modified clip illustrated in Figures 21 and 22;

Figure 24 is a plane view of still another modification of the paper clip illustrated in Figure 1;

Figure 25 is a side elevational view of the modified paper clip shown in Figure 24;

Figure 26 is a plane view of a further modification of the paper clip illustrated in Figure 1;

Figure 27 is a side elevational view of the modified paper clip shown in Figure 26; and

Figure 28 is an end view showing the manner in which sheet material is retained between the legs of the paper clips of this invention.

Returning now to the drawings, more particularly to Figure 1, wherein like reference symbols indicate the same parts throughout the various views, a clip **1** formed from a strip of resilient stock is shown. The strip has a substantially circular cross-section and is bent at **2** and **3** at substantially an acute angle. The bends **2** and **3** result in the formation of a main or central portion **4** and legs **5** and **6**. The legs **5** and **6** are not straight but are curved slightly so that the curves open toward each other. The legs cross over at **7**, but it is not necessary that they contact each other at the cross-over point. This cross-over point occurs in the lower portions of each of the legs, and, as may be seen in Figure 1, is illustrated as occurring in the lower one-quarter of each of the legs.

The ends of the legs indicated as **8** and **9**, respectively, are formed with gripping surfaces **10** and **11**. These gripping surfaces are substantially parallel to the plane formed by the main portion **4** and the respective legs **5** and **6**. Furthermore, each of the ends **8** and **9** are curved at **12** and **13**, as illustrated in Figure 1, toward each other and in the plane formed by the respective legs and the main portion.

The gripping surfaces **10** and **11** are preferably formed by the method illustrated in Figures 6 and 7. Reference to Figures 6 and 7 will indicate that the end of the leg is first bent at a slight acute angle as indicated at **14**. This bend is in the direction of the sheet material which is to be retained in the clip. This bent portion is then ground along the line indicated at **15**, and the result is the gripping surface **10** as illustrated in Figure 7. The grinding results in a smooth flat surface which is substantially parallel to the plane formed by the main portion and the respective leg. It is not necessary, however, that the grinding plane **15** contact the leg. The distance of the grinding plane from the leg will determine the size of the grinding area. The grinding further results in a sharp rim on the grinding surface along the sides **16** and **17** and the end **18**, as may be seen in Figure 3.

Figures 8 and 9 indicate an alternate method of forming the ends of the clip legs. As seen in Figure 8, the grinding plane is at an angle to the leg and the result is a pointed gripping surface which may puncture and damage the sheet material.

Proceeding next to Figure 10, there is illustrated a modified clip **19** which is substantially similar in respect to the clip of Figure 1 except that the ends of the leg portions are not curved. In addition, the cross-over point **7** occurs closer to the bends **2** and **3**.

The manner in which the clip illustrated in Figure 1 is opened to permit the insertion of sheet material between the legs is illustrated in Figure 11. Indicated by the circles **20** and **21** in Figure 1 are the squeeze points or pressure areas to be contacted by the fingers in opening the grip. As can be seen in Figure 11, the clip is gripped between the thumb and the second finger at the squeeze point **20**, and the forefinger applies a pressure at the circle **21** to separate the legs. When the sheet material has been inserted between the legs and pressure by the fingers on the clip has been released, the sheet material will be retained in the clip by pressure exerted by the gripping surfaces on the ends of the legs and not by the entire leg as is usually done in conventional paper clips. As may be seen in Figure 7, the end of the leg is finished off into a point or sharp rim which sharp rim closely engages the surface of the sheet material. Consequently, loose or extra sheets of paper which slide over the paper clip will not be caught by the ends of the paper clip legs but will slide smoothly over these legs. The close engagement of the gripping surface with the sheet material will prevent any additional sheets of material from becoming accidentally inserted between the legs of the clip.

Proceeding next to Figure 12, there is illustrated a modification of the clip shown in Figures 1 and 10 and indicated by the reference numeral **22**. The clip **22** is similarly formed from a single strip of resilient stock indicated at **23** and having a substantially circular cross-section. The clip **22** comprises a reverse bend **24** which forms a reverse bend portion **25** and arms **26** and **27**. Each of the arms further has a U-shaped bend indicated at **28** and **29**, which is in the plane of the reverse bend portion but is substantially at right angles thereto. The U-shaped bend portions open toward each other as may be seen in Figure 12.

The ends of the arms **26** and **27** are bent to form the legs **30** and **31**, which cross over each other at the cross-over point **32**, at which point they are also in engagement with each other. The extreme portions of the leg, as illustrated at **33** and **34**, are parallel to each other and extend within the reverse bend portion **25**. Each of the legs **30** and **31** is provided with a gripping surface **35** and **36**. As may be seen in Figures 15 through 18, the gripping surface **36** is larger in area than the gripping surface **35**.

The clip **22** illustrated in Figure 12 is manipulated to permit the legs to pivot about each other at the cross-over point so that the legs move outwardly from the plane of the reverse bend portion. This is accomplished by placing the second finger under the U-bend **29** at the area indicated at **37** and placing the thumb fingernail along the line indicated at **38**. The forefinger is then applied underneath the clip at the area indicated at **39**. Moving of the forefinger upwardly will pivot the legs about each other at the cross-over point and to pivot outwardly away from the plane of the reverse bend portion. The reverse bend portion is then inserted into the sheet material in such a manner that the pivoted legs are positioned against the outer surfaces of the material. When the pressure of the fingers exerted as described above is released, the gripping areas on the legs will press against the outer surfaces of the sheet material to grip the sheet material **40** against the reverse bend portion. When the clip of Figure 12 is in position, a top view of the clip and sheet material will appear to the observer as illustrated in Figure 20.

Proceeding next to Figure 21, there is illustrated a clip **41** which is a further modification of the clip shown in Figure 1. The clip **41** is similarly formed from a single strip of resilient stock which is bent at substantially a right angle **42** to form arms **43** and **44**. The arms **43** and **44** are then bent at angles **45** and **46** rigidly to form legs **47** and **48** which extend toward each other. The legs **47** and **48** are then bent inwardly and cross over at a point **49** so as to form a closed main portion **50**. The legs **47** and **48** are further bent at **51** and **52** so that they are substantially parallel to each other and extend outwardly of the closed main portion on either side of the right angle bend **42** and on opposite sides of the strip forming the clip.

Clip **41** is operated so as to pivot the legs **47** and **48** about each other at the cross-over point **49** whereby sheet material may be inserted between either of the legs and the closed main portion **50**. The legs are pivoted by gripping the clip with the thumb and second finger at the

grip area 53 and subsequently using the forefinger to lift the leg of the clip at the grip area 54. Moving the forefinger upwardly will pivot the legs about each other at the cross-over point and will spread the legs outwardly from the closed main portion. After the sheet material has been inserted, pressure exerted by the forefinger is released and the legs will then grip the material between either of the legs and the closed main portion.

It is possible with this clip to retain as many as twenty-five sheets of paper between one of the legs and the closed main portion.

In Figure 24 there is illustrated still another modification of the clip disclosed in Figure 1 and indicated at 55. Clip 55 is similarly formed from a single strip of resilient stock and has a plurality of bends 56, 57 and 58 to form a closed main portion 59. The ends of the strip cross over at the point 60 to form legs 61 and 62, of which the leg 61 is considerably shorter in length than the leg 62. The leg 61 is further bent at 63 so that the major portion of the leg extends substantially parallel to a section of the closed main portion extending between the bend 56 and the cross-over point 60.

The longer leg 62 is bent at 64, 65 and 66 as illustrated in Figure 24 so that the portions of the leg between the bends 64 and 65 and 65 and 66 are substantially parallel to the sections of the closed main portion extending between the cross-over point 60, bend 58 and the bends 58 and 57 respectively. The leg 62 is bent at 66 in such a manner that it crosses over the closed main portion at the points 67 and 68 just inwardly of the bend 57. The leg 62 further continues to cross over the shorter leg 61 adjacent the end thereof at the cross-over point 69. It is pointed out that the leg 62, where it crosses over the closed main portion at 67 and 68, is on the opposite side of the strip from the leg 61 where it crosses over at 60.

The clip 55 is similarly manipulated by pivoting the legs 61 and 62 outwardly of the closed main portion 59. This is accomplished by placing the forefinger under the clip at the grip area 70 and the second finger under the clip at the grip area 71. The thumb is then pressed downwardly on the grip area 72, which is at the bend 58. This will result in the shorter leg 61 pivoting outwardly from the closed main portion 59 at the cross-over point 60 and the longer leg 62 pivoting outwardly of the closed main portion at the cross-over point 67. In this clip also, sheet material may be retained between either one of the legs and the closed main portion.

Proceeding next to Figure 26, there is illustrated a clip 73 which is still a further modification of the clip illustrated in Figure 1. The clip 73 is also formed from a single strip of resilient stock and is bent at the points 74, 75, 76 and 77 substantially as shown in Figure 26 so that the ends of the strip cross over at 78 to form a short leg 79 and a long leg 80. The short leg 79 has a bend 81 and a further bend 82 to enable the leg to cross over the closed main portion 83 at the points 84 and 85 just inwardly of the main portion bend 77. The main portion 83 is formed by the strip being bent at 74, 75, 76 and 77 and the closing thereof by crossing over the legs at the point 78.

The longer leg 80 is so bent at 86 that it contacts the main portion bend 74 on the side opposite from the crossing over of the main portion by the short leg at the points 84 and 85. The long leg is again bent at 87 and 88. As a result of the bends 87 and 88 in the long leg 80, this leg will cross over the closed main portion at the points 89 and 90 inwardly of the closed main portion bend 75. The end thereof, indicated at 91, is substantially parallel with the end of the short leg indicated at 92. The ends of the legs 91 and 92 are on opposite sides of the bend 76 and also on opposite sides of the strip forming the main portion.

The clip 73 is similarly operable so as to retain sheet material between either of the ends of the legs 91 and 92 and the closed main portion 83. To open the clip, the second finger is placed below the clip at the grip area 93 and the forefinger below the clip at the grip area 94. To actually open the clip, the thumb is pressed downwardly at the grip area 95 while the forefinger is lifted upwardly. As a result the leg end 92 will pivot outwardly from the closed main portion by the pivoting of the short leg 79 at the point 74. The leg end 91 will also pivot outwardly from the closed main portion but in an opposite direction by the pivoting of the long leg 80 at the cross-over point 89.

Proceeding next to Figure 28, there is shown an end view of papers 96 which are retained between one of the legs and the closed main portion. This view will be substantially the same for any of the clips as illustrated in Figures 21, 24 and 26. The ends of the clamp legs are generally spaced at least $\frac{5}{32}$ of an inch, depending upon the size of the clip. Such a space will bend the paper to form the hollows as indicated at 97 and 98. Consequently, when extra sheets of paper are slid over the clip, they will not contact the clamping portion of the leg but will merely rest on the sheets of paper 96. As shown in Figure 28, the extra sheets of paper indicated at 99 do not contact either of the clamping legs as indicated at 100 and 101.

It is further pointed out that the ends of the clamping legs of each of the modifications illustrated in Figures 21, 24 and 26 may be formed with the gripping areas as described above.

Thus it can be seen that by using the clip as described above, together with the structure on the ends of the legs also described above, a more effective and less damaging gripping area is obtained from the clip. Specifically, the following results will follow from using the clips of this invention as described above:

(1) Both of the legs will press and slide on the sheet material without puncturing the sheet material.

(2) The curved rim and curved outer surfaces of the legs are necessary to protect extra papers outside the clip when the clip is in either straight or diagonal position.

(3) The rim of the leg contacts the paper surface all around the sides of the end of the foot to exclude extra papers.

(4) The leg has enough curvature therein so as to not press against the papers so that the sole gripping action is obtained by the gripping areas of the ends of the legs pressing against the papers contained in the clip.

Furthermore, both clips are easily fabricated from a single continuous strip of resilient stock, both clips are easy to open so as to insert sheet material between the legs, and both clips may be easily removed from the sheet material without damaging or marring the material in any way. The even pressure of the gripping area around the periphery of the rim thereof will insure an equal force exerting on the paper and that no part of the gripping action will bear against the paper with a greater force in such a way as to damage or mar the paper. The close engagement of the perimeter of the rim with the sheet material will prevent undesired sheets of paper from becoming inserted between the legs of the clip.

It will be understood that this invention is susceptible to modification in order to adapt it to different usages and conditions, and, accordingly, it is desired to comprehend such modifications within this invention as may fall within the scope of the appended claims.

What is claimed is:

1. A clip for sheet material comprising a single strip of resilient stock having a first reverse bend portion with parallel sides, the end portions of said strip forming arms of substantially equal length, a substantially U-shaped bend in each of said arms at right angles to the sides of said reverse bend and in the same plane therewith to form legs at the ends of the strip, the open portions of said U-shaped bends facing toward each other, one of said legs crossing over the other of said legs with said

legs being parallel to each other beyond the crossing over point and being positioned entirely within said reverse bend and extending substantially in the direction thereof whereby said legs are pivotable about the crossing over point when pressure is applied to said clip in opposite directions substantially perpendicular to the plane of the reverse bend and sheet material can be retained between one of said legs and said reverse bend.

2. A clip for sheet material comprising a continuous strip of resilient stock having a first bend and spaced bends on each side of said first bend so as to constitute a central portion and the ends of the strip forming two legs extending therefrom, said legs crossing over each other at a single point and each leg having a single bend therein after said cross-over point so that said legs are substantially parallel to each other after the cross-over point, said legs having portions being curved toward each other so that said curved portions are in planes perpendicular to the central portion, there being flat gripping surfaces on the ends of said legs, said flat gripping surfaces being on the inner faces of said legs and adapted to face each other so as to retain sheet material inserted between said legs, each of said gripping surfaces having a sharp rim at the sides and outer end thereof.

3. A clip for sheet material comprising a single strip of resilient material having a plurality of bends in a single plane to form a closed main portion and legs adapted to cross over each other and extend into the main portion at the cross over point, at least one of said legs being positioned with respect to said main closed portion to retain sheet material in said clip between said one leg and said main portion, said legs having portions being curved toward each other so that said curved portions are in planes perpendicular to the plane of the main portion, there being flat gripping surfaces on the ends of said legs, said flat surfaces being on the inner faces of said legs and adapted to face each other so as to retain sheet material inserted between said legs, each of said gripping surfaces having a sharp rim at the sides and outer end thereof.

4. A clip for sheet material comprising a single continuous strip of resilient stock having a reverse bend so as to form two arms, each of said arms having a reverse bend therein with the portions of said strip outwardly of said arm reverse bends forming legs, one of said legs crossing over the other said leg outwardly of said arm reverse bend and being in contact therewith whereby the resiliency of the strip permits said legs to pivot about each other when pressure is applied to said clip in opposite directions substantially perpendicular to the plane of the reverse bend and sheet material is adapted to be retained between one of said legs and said reverse bends, said legs having portions being curved toward each other so that said curved portions are in planes perpendicular to the plane of the main portion, there being flat gripping surfaces on the ends of said legs, said flat surfaces being on the inner faces of said legs and facing each other so as to retain sheet material inserted between said legs, each of said gripping surfaces having a sharp rim at the sides and outer end thereof.

5. A clip for sheet material comprising a single strip of resilient material having a plurality of bends in a single plane to form a closed main portion and legs adapted to cross over each other and extend into the main portion at the cross over point, both of said legs having bends therein within said closed main portion so that the said legs are parallel, the parallel ends of said legs extending outwardly of said closed main portion opposed from said cross-over point and on opposite sides of the strip material whereby each leg is adapted to retain sheet material between said leg and the closed main portion, said legs having portions being curved toward each other so that said curved portions are in planes perpendicular to the plane of the main portion, there being flat gripping surfaces on the ends of said legs, said flat surfaces being on the inner faces of said legs and adapted to face each other so as to retain sheet material inserted between said legs, each of said gripping surfaces having a sharp rim at the sides and outer end thereof.

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