

Feb. 25, 1969

S. A. MACONDRAY ETAL
CHARGE OF PAPER CLIPS

3,429,431

Filed April 7, 1966

Sheet 1 of 2

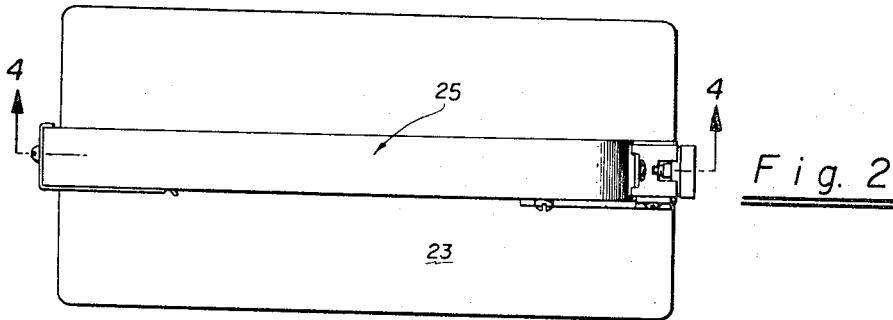


Fig. 2

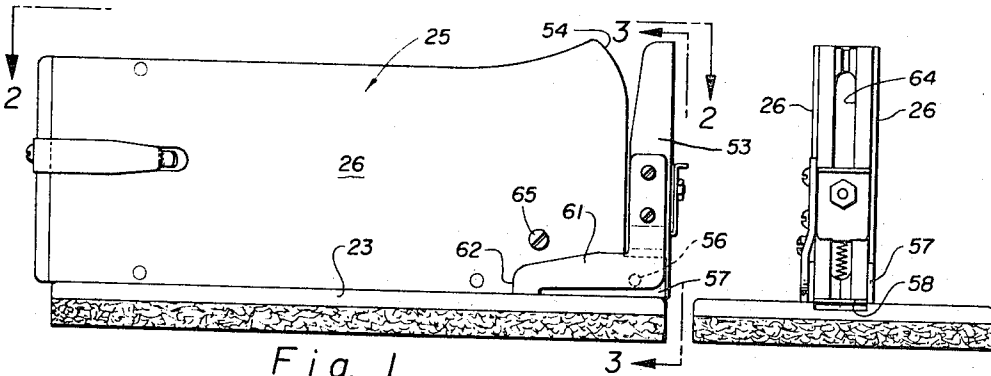


Fig. 1

Fig. 3

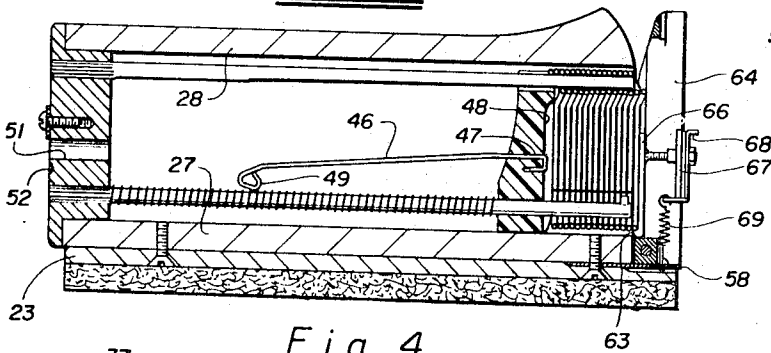


Fig. 4

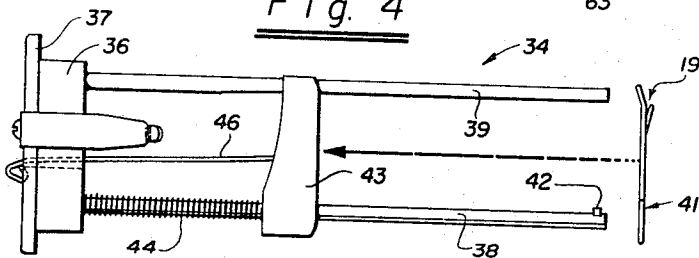


Fig. 5

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Sheet 2 of 2

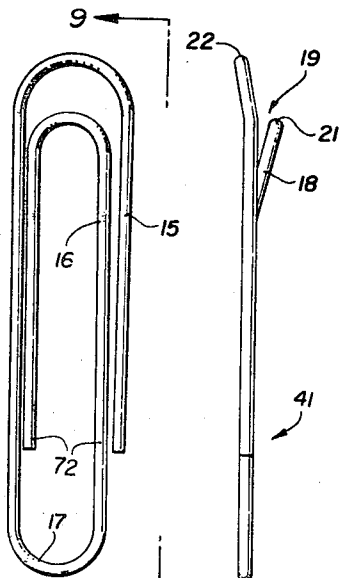


Fig. 8 Fig. 9

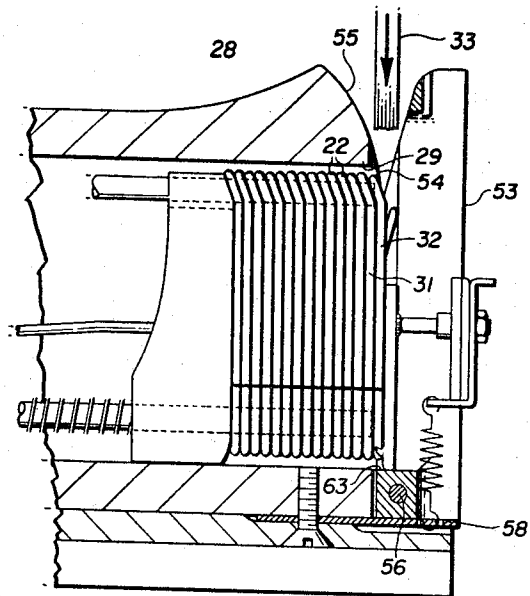


Fig. 6

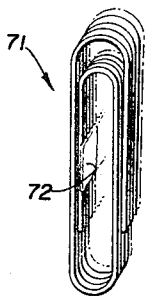


Fig. 10

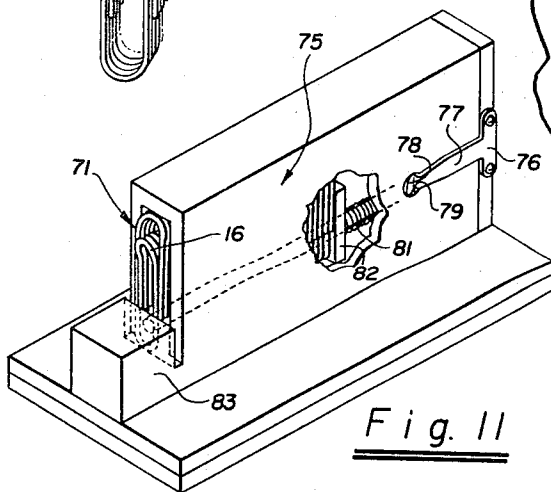


Fig. 11

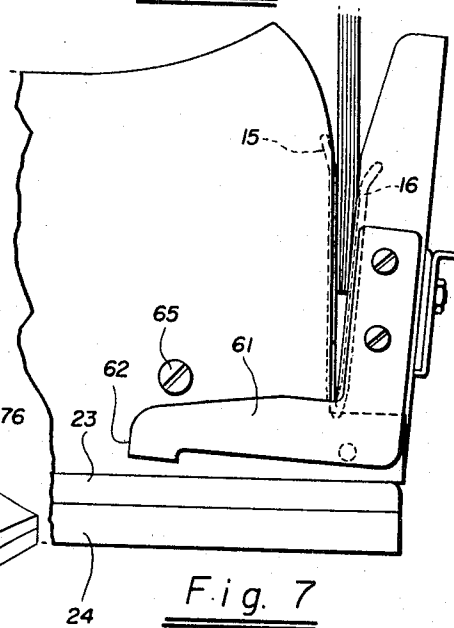


Fig. 7

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CHARGE OF PAPER CLIPS

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Continuation of application Ser. No. 357,924, Apr. 7, 1964, now Patent No. 3,254,398, dated June 7, 1966.

This application Apr. 7, 1966, Ser. No. 540,954

U.S. Cl. 206-56 5 Claims

Int. Cl. B65d 83/00; B23q 7/10; B23p 17/00

ABSTRACT OF THE DISCLOSURE

A paper clip dispensing machine and charge of clips for use therein. Each clip of the charge includes a pair of resilient spreadable leaves joined at one end and open at the other to receive a sheaf of sheet material therebetween. Entry of a sheaf of material between the leaves of a clip serves to rupture a bond holding the clip to the next adjacent clip of the charge. The movement of the movable leaf serves to break the bond when it is spread away from the remainder of the charge.

This application is a continuing application of our co-pending application, now U.S. Letters Patent 3,254,398 filed Apr. 7, 1964 and issued June 7, 1966. This invention relates to a charge of paper clips particularly useful in clip dispensing and attaching apparatus of the type disclosed in the above identified patent.

In the above identified application, there is disclosed apparatus of the type particularly useful for attaching paper clips and the like to a sheaf of sheet materials.

Apparatus and devices for dispensing and attaching paper clips to a sheaf of sheet materials as previously known, have required generally a two-handed operation, as where a sheaf of materials held in one hand is inserted into a dispensing slot and then, with the other hand, means are actuated which serve to eject the paper clip onto the sheaf. Thus, both hands of the operator come into play in applying a clip to the sheaf of materials. According to the apparatus disclosed in the above identified application, a sheaf held in one hand can be moved into a clip dispensing slot where a paper clip is held stationary to receive the sheaf between the leaves of the clip and, upon withdrawal of the sheaf, the paper clip is released from the slot and carried with the sheaf. In general, it is an object of the present invention to provide a charge of clips adapted to be loaded as a unitary construction into apparatus of the above kind.

It is another object of the invention to provide a unitary charge of paper clips wherein the clips are manually dispensed singly.

These and other objects of the invention will be more clearly apparent from the following detailed description of a preferred embodiment thereof when considered in conjunction with the accompanying drawings, in which:

FIGURES 1 through 3 represent side elevation, plan, and end elevation views respectively of a clip dispensing apparatus according to the above identified application;

FIGURE 4 is an elevation section view taken along the line 4-4 of FIGURE 2;

FIGURE 5 is a detailed view showing a cartridge construction for loading clips into the dispensing apparatus;

FIGURE 6 is an enlarged detailed section view similar to a corresponding portion of FIGURE 4;

FIGURE 7 is an enlarged detailed view in side eleva-

tion showing a sheaf of sheet material entering the clip dispensing station;

FIGURES 8 and 9 are front and side elevation views of a paper clip adapted to be employed with the apparatus;

FIGURE 10 is a perspective view of a unitary charge of clips adhered together for use in the apparatus; and

FIGURE 11 is a perspective view of a simplified embodiment of the apparatus disclosed in the above identified application.

In general, there has been provided herein a unitary charge of clips of a type characterized by resilient leaves joined at one end and open at the other. One of the leaves diverges away from the plane of the other at the open end of the clip to form a sheaf-receiving throat, the throats of the clips being adapted to be disposed to receive a sheaf of sheet material therein at a dispensing station of apparatus of a type described in the above identified application. The leaves of each clip are arranged whereby as one leaf of each clip is resiliently spread away from the other leaf during insertion of a sheaf of material therebetween, the leaf which is spread from the other ruptures a bond between the adhering portions of adjacent clips. It will be readily apparent that a charge of clips, according to the invention herein, is particularly adapted for use in apparatus as described in the above identified application, but not necessarily limited to use therein alone. The clip dispensing apparatus as described in said application is particularly useful in dispensing paper clips or other clips of the type characterized by the resilient leaves joined at one end and resiliently spreadable from each other at the other end when receiving a sheaf of material between the leaves. The leaves resiliently grip the sheaf and engage the same by friction.

In particular, as is known, clips of this type can include an outer coil 15 and an inner coil 16 as shown in FIGURE 8. Coils 15, 16 are joined at one end, as by a bridge portion 17 and are resiliently spreadable from each other at the opposite end.

It is particularly desirable in the present instance that at least one of the leaves be formed at the open end of the clip so as to diverge away from the plane of the clip as shown by the diverging portion 18 in FIGURE 9. Portion 18, as it diverges from the plane of the clip thereby provides an open mouth 19, adapted to receive a sheaf of sheet material. The ends of leaves 15, 16 at the mouth 19 serve to provide lips 21, 22 thereof. It is further desirable that both lips 21, 22 diverge away from the plane of the clip and in opposite directions so as to widen the mouth 19.

In general, and to enhance an understanding of the use of the charge of clips herein, apparatus as described in detail in the above application is further described herein. There is provided a magazine to contain and direct each of a plurality of clips to a dispensing and attaching station where each clip can be attached to a sheaf of sheet material and withdrawn with same upon removal thereof from the station. That clip which is to be attached to the sheaf is restrained from moving with the sheaf during entry of the sheaf between the leaves of the clip. The device is arranged to permit the leaves to spread so as to become attached to the sheaf and is further arranged to release the attached clip during removal of the sheaf from the attaching station after attachment of the clip to the sheaf. Means are further provided to retain the clip which is next adjacent to the attached clip during withdrawal movement of the sheaf from the station.

As will be readily evident from the following description of the dispensing device, it can be oriented in virtually

any plane. However, as disclosed herein it is shown and described to rest upon a base plate 23, the underside of which is prepared with a soft pad 24 so that the device can sit upon a desk top or the like without marking the surface.

Means forming a magazine to contain and direct each of a plurality of clips provides the main body portion of the apparatus. The magazine 25 includes a pair of parallel side plates 26 spaced apart and enclosed top and bottom by a bottom plate 27 and a top plate 28. Plates 26 can be screwed to plates 27, 28 to form a hollow box construction forming magazine 25. Magazine 25 is open at one end forming a dispensing opening through which each clip is fed to a dispensing station.

Means for retaining that clip which is next adjacent to the clip being attached to the sheaf is provided whereby upon withdrawal of the sheaf and attached clip, the next adjacent clip is retained and moved into position to be attached to the next sheaf entering the dispensing station. Thus, the lower edge of top plate 28 forms a shearing edge 29. Shearing edge 29 is disposed to abut lip 22 of a clip 31. Clip 31 is adjacent a clip 32 which is to be attached to a sheaf 33 of sheet material. Shearing edge 29, in addition, permits clip 32 to be dispensed by passing clear of the edge and thereby separates clip 32 from clip 31.

A cartridge construction 34 carries a charge of clips within magazine 25. See FIGURE 5. A back plate 36 is dimensioned to be received in the loading end of magazine 25 and is provided with a flange 37 formed to abut the ends of plates 26, 27, and 28. Two spaced parallel rods 38, 39 serve to support and guide a plurality of clips such as 41 within magazine 25. Rods 38, 39 can be dimensioned to prevent improper loading of clips 41, for example, in an inverted position, by taking advantage of the fact that the width between the sides of loop 15 is greater than the width between the sides of the clip at the bottom end 17. In addition, if desired, a tab 42 can be provided which increases the size of rod 38 at its loading end whereby the spacing between the lips 21, 22 of a clip will not pass over the tab and hence rod 38 cannot be fed between lips 21, 22.

A pressure plate 43 is provided to slidably ride on rod 38 and be guided by rod 39.

A spring 44 carried on rod 38 between plate 43 and plate 36 serves to apply a biasing force along an axis substantially normal to the plane of a clip 41 and passes through the plane thereof at the region of the end of the clip remote from its mouth 19. The advantage of so arranging spring 44 will be more readily apparent from the description further below.

Means are provided retaining pressure plate 43 in a retracted position while clips 41 are loaded onto rods 38, 39. Thus, a wire 46 having a J-shaped end 47 is engaged in a slot 48 to be recessed below the pressure surface of plate 43. The other end of wire 46 is turned upon itself to form a hook 49 which when passed through a hole 51 in back plate 36 is adapted to engage a detent 52 and be retained therein. After a full charge of clips 41 has been loaded onto rods 38, 39, hook 49 is moved out of detent 52 and aligned with hole 51 whereby the biasing force of spring 44 is released to urge pressure plate 43 to feed clips 41 to the dispensing station.

The dispensing station is characterized by a sheaf receiving slot defined between the dispensing end of magazine 25 and a pivoted jaw member 53. As previously noted, the dispensing end of magazine 25 includes the shearing edge 29 formed at the end edge of top plate 28. Top plate 28 and the end edges of side plates 26 are rounded to diverge upwardly and outwardly so as to guide sheaf 23 into a clip positioned to be dispensed as designated at 32 in FIGURE 6. Thus, the end edges 54 and end surface 55 serve to direct the left face of sheaf 33 as shown in FIGURE 6 over lip 22 of clip 32 and direct sheaf 33 into the throat of the clip.

After entry of sheaf 33 into the throat 19 of clip 32 it will be readily apparent that the left hand leaf of clip 32 will be retained upright between the left face of sheaf 33 on the one side and the next adjacent clip 31 on the other. Pivoted jaw member 53 is carried to pivot about a pin 56 disposed between forwardly extending tabs 57 formed at the lower edge of, and integral with, side plates 26. A leaf spring 58 resiliently urges jaw member 53 in a counterclockwise direction as shown. Thus, jaw member 53 permits leaf 16 of clip 32 to be resiliently spread away from leaf 15 thereof, as sheaf 33 moves downwardly through throat 19. (See FIGURE 7.) In short, it is to be noted that resiliently yielding, hinged jaw member is pivoted adjacent the lower end region of clip 32 to abut the same thereat for purposes yet to be described. The pivoted end of the jaw member is positioned transversely of the axis of spring 44 to yieldingly resist the applied biasing force thereof at the lower end of clip 32. Jaw member 53 thereby serves to pinch the lower end of the clip to be dispensed between the pivoted end of the jaw member 53 and the lower end region of the clip disposed next adjacent to the clip which is to be dispensed.

Inasmuch as lip 21 of each clip diverges out of the plane thereof, the face of jaw member 53 should be relieved to form a channel accommodating the protruding lip.

The upper portion of jaw member 53, starting slightly above the midpoint, diverges outwardly away from the plane of the clip to be dispensed. Thus, as the clip is drawn out of the dispensing slot, it makes less and less frictional contact with the face of jaw member 53.

The width of jaw member 53 is slightly less than the width of the opening in magazine 25 whereby the jaw member fits between tab portions 57. An L-shaped stop member 61 is screwed to the side of jaw member 53 and is provided with a foot 62 disposed to abut base plate 23. Stop member 61 is dimensioned to dispose jaw member 53 whereby sheaf 33 when comprised of only two or three lightweight sheets of paper, for example, need not force its way into the dispensing slot by pushing jaw member 53 out of the way. Stop member 61 is further dimensioned whereby one and only one clip 41 is allowed to enter the dispensing slot. Thus, as shown in FIGURE 6, clip 32 is held in position whereby edge 54 serves to direct the left face of sheaf 33 over lip 22 thereof. On the other hand, lip 22 of the adjacent clip 31 is held to the rear of shearing edge 29. Accordingly, stop 61 serves to properly position the clips in the dispensing slot.

The dispensing slot is arranged to include means serving to restrain that clip which is to be attached, from moving with the sheaf 33 during entry of the sheaf between the leaves thereof. See FIGURE 6. As sheaf 33 enters the throat 19 of clip 32, clip 32 immediately bottoms in the dispensing slot against a pair of projecting teeth 63 formed to extend into the plane of clip 32 at a position below same.

Means are provided whereby clips can be dispensed from the magazine individually without inserting a sheaf 33, if desired. Thus, jaw member 53 includes a way 64 and a clip ejector member 66 slidably movable along the way between retracted and advanced positions. Ejector member 66 includes a portion 67 extending beyond jaw member 53 to the right thereof as shown. Portion 67 is formed with a lip 68 adapted to be engaged by a finger of a person using the device in order to move the ejector member 66 to its upper position.

Ejector member 66 is formed to include the clip engaging teeth 63 extending into the plane of the clip which is to be dispensed. Teeth 63 are disposed to engage a portion of the clip as ejector member 66 moves upwardly to its advanced position. In so moving, teeth 63 carry the clip to be dispensed (e.g. clip 32) upwardly to an advanced position whereby the upper end of the clip is exposed to be manually withdrawn. A helical spring 69 couples portion 67 to leaf spring 58 and thereby serves

to resiliently return ejection member 66 to its retracted position after release of ejector 68.

A screw 65 extends outwardly into the plane of movement of arm 61 to arrest pivotal movement of same whereby jaw member 53 cannot inadvertently be rocked fully away from the open end of magazine 25. Thus, the inadvertent discharge of a complete charge of clips is prevented.

In order to readily insert a loaded cartridge of clips into magazine 25, a preferred charge 71 of clips is provided as a unitary construction to be loaded into magazine 25. Each clip is adhered to the next at a portion 72 of leaf 16 of each. As will be recalled, leaf 16 is the leaf of the clip which is permitted to be resiliently spread apart during entry of sheaf 33 into throat 19. Portion 72 of leaves 16 is disposed substantially remote from the throat 19 of each clip to permit the entering sheaf 33 to spread the leaves 15, 16 and rupture the bond between the adhering portions of adjacent clips. Thus, each clip, after it becomes attached to the sheaf 33, is released in the process from the other clips forming the remainder of charge 71. In order to adhere clips to each other along a portion disposed at 72, suitable adhesive material can be applied; the wire of each clip can be modestly fused thereat; or a light deposit of bonding metal can be disposed along a narrow band of the inner portion of leaf 16.

One suitable method for achieving this adhesion of the clips one to the other is by means of an elongated thin heated tongue which can be inserted along the charge of clips as they are held closely together on a rod passing between lips 21, 22. After the tongue is inserted along the charge of clips, it can be axially rotated to cause a modest fusion between the clips in the region of portion 72.

The apparatus is arranged whereby after attachment of a clip to sheaf 33, the clip is released so as to be carried with the sheaf as it is withdrawn from the dispensing slot. As noted above, each clip to be dispensed is held primarily at its lower end. A holding pressure is applied by spring 44 forcing the lower region of the clips into abutment with jaw member 53 at its pivoted end. The fact that the sheaf 33 serves to wedge the leaves of each clip apart, causes the clip to be held along a limited length thereof by frictional engagement.

The frictional engagement of the resiliently yielding surface of jaw member 53 plus the frictional engagement between the clip to be dispensed and the next adjacent clip provides substantially the total friction serving to hold the clip within the device. This total friction is insufficient to overcome the grip of the clip with respect to a sheaf 33 so that withdrawal of sheaf 33 carries the clip with it. During withdrawal of the clip from the device, shearing edge 29 serves to hold the next adjacent clip from being carried along.

A simplified embodiment of the apparatus shown in the above referenced application is shown in FIGURE 11 wherein a magazine 75 is provided with a cartridge 76 similar to cartridge 34 described above. Cartridge 76 is retained within magazine 75 by engagement of a leaf spring 77 including an inwardly formed lip 78 engaging a hole 79 in the side of magazine 75. A spring 81 urges a pressure plate 82 against the rear of a charge 71 of clips to be dispensed. Spring 81 acts along an axis which intercepts an abutment portion 83 aligned whereby the lower end of each clip is pinched between abutment portion 83 and the lower end of the next adjacent clip of charge 71. Thus, as a sheaf of sheet material moves downwardly into the open throat 19 of each clip, leaf 16 thereof will be permitted to bend forwardly and rupture the adhering bond between the clip to be dispensed and the adjacent clip of the charge. The top of magazine 75 extends sufficiently far along the charge to overlie the upper lip 22 of the next adjacent clip to be dispensed. Thus (although not entirely necessary when the remaining charge includes a considerable number of clips) for the last few clips to be dispensed, the overhanging shearing edge formed by

the top of magazine 75 serves to retain the clips from being withdrawn or dislodged from the magazine.

From the foregoing, it will be readily evident that one-handed operation for applying a paper clip to a sheaf of material is readily accomplished merely by inserting the sheaf of material into the dispensing slot and subsequently withdrawing the sheaf from same.

It will be further readily evident that if it is desired to obtain a single clip for manual attachment or other use, the ejector member 66 can be manually moved from a retracted to an advanced position whereby teeth 63 urge a single clip out of the device.

The charge of clips can be readily loaded into the magazine of either of the dispensing device embodiments, either as a unitary supply item or as a pre-loaded cartridge.

We claim:

1. The article comprising a unitary charge of clips of a type characterized by resilient leaves joined at one end and open at the other, one of the leaves diverging away from the plane of the other at the open end of the clip to form a sheaf-receiving throat, a bond serving to adhere said clips to each other at a portion thereof formed and disposed to be moved primarily away from the plane of the clip and relative to adjacent portions of the clip upon entry of a sheaf of material between said leaves, the bond being disposed to be ruptured by such movement to separate one clip from the next.

2. The article comprising a unitary charge of clips each clip including resilient leaves joined at one end and open at the other, one of the leaves diverging away from the plane of the other at the open end of the clip to form a sheaf-receiving throat, one of said leaves being relatively movable away from said plane of an adjacent one of said clips upon entry of the sheaf between the leaves of the first named clip, a bond formed between the movable one of said leaves and a portion of said adjacent one of said clips, said bond being formed and disposed to be ruptured by movement of said movable one of said leaves upon entry of said sheaf so as to release one clip from another.

3. Clip dispensing apparatus according to claim 2 wherein said portion of the adhering leaves is disposed substantially remote from the throat of each clip to permit the entering sheaf to spread the leaves and rupture the bond between said adhering portions of adjacent clips, to release the sheaf-engaging clip from the remainder of the charge of clips.

4. The article comprising a charge of clips comprising a plurality of clips each including a pair of resilient leaves joined at one end and open at the other, one of said leaves being relatively movable with respect to the other in a direction primarily away from a plane common to each, said charge of clips being adapted to be contained in a magazine of a dispensing device and to be directed to move the clips into a dispensing and attaching station for attachment to a sheaf of sheet material thereat, and being further adapted to be withdrawn therefrom with the removal of the sheaf from the station, each clip including portions adapted to engage a restraining portion of said device while disposed at said station to restrain the clip at said station from movement with the sheaf as it enters between the leaves of the clip, said clips being adhered to each other by a bond therebetween formed between a portion of one clip movable in said direction and a portion of an adjacent clip, said portion thus bonded to the adjacent clip being movable in said direction upon entry of a sheaf to spread the leaves and rupture the bond to release the entered clip from the charge.

5. The article according to claim 4 wherein that portion of said clips remote from the open end thereof is formed and adapted to engage the restraining portion of the device while the clip is disposed at the dispensing station, said bond for each clip is disposed at a portion of

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the clip between the leaves thereof at a disposition remote from said open end of the clip.

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U.S. Cl. X.R.

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