Nov. 22, 1949 B. J. PILLINER 2,488,828

CRIMPING OR PLEATING

Filed July 1, 1946 2 Sheets-Sheet 1

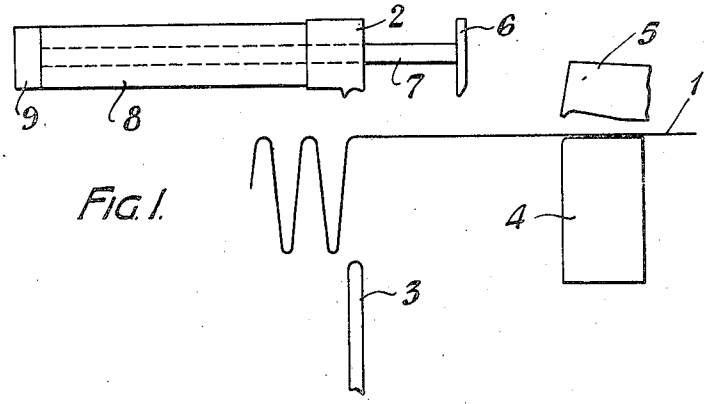


FIG. 1.

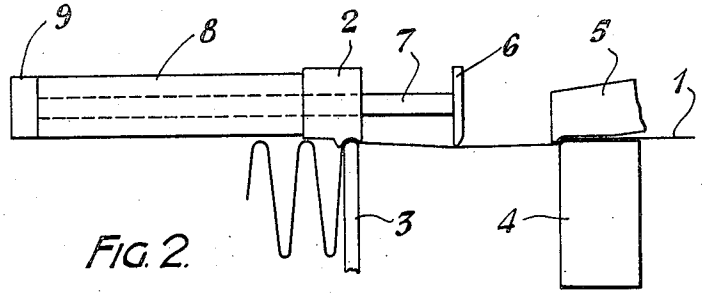


FIG. 2.

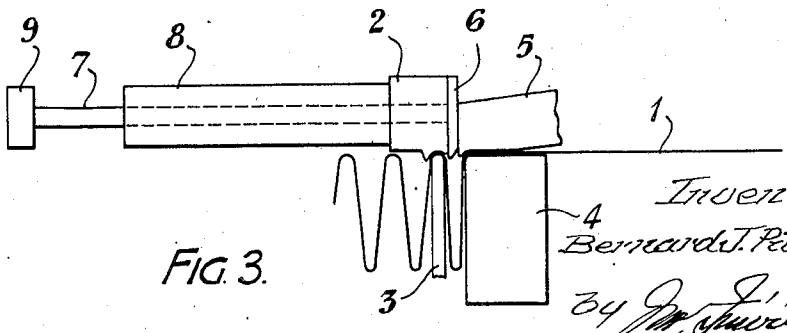


FIG. 3.

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Nov. 22, 1949 B. J. PILLINER 2,488,828

CRIMPING OR PLEATING

Filed July 1, 1946 2 Sheets-Sheet 2

FIG. 4.

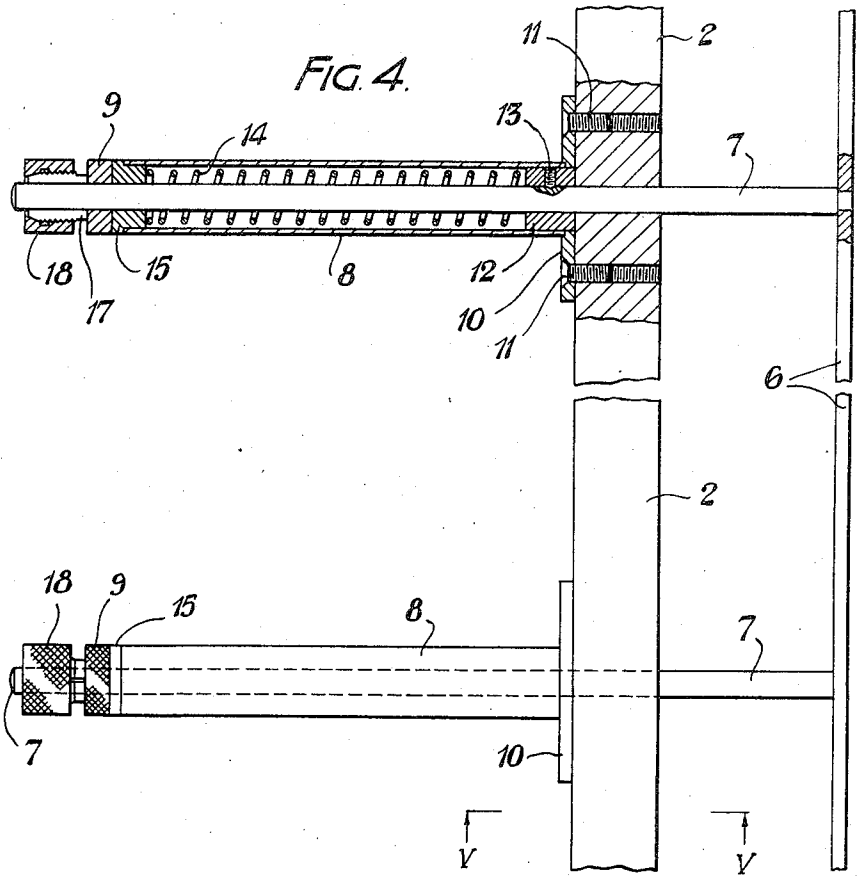


FIG. 5.

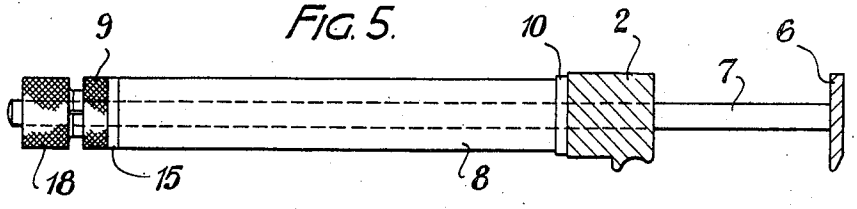
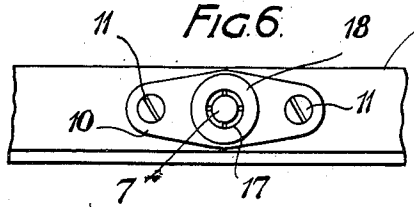


FIG. 6.



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UNITED STATES PATENT OFFICE

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CRIMPING OR PLEATING

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Application July 1, 1946, Serial No. 680,807
In Great Britain December 15, 1944

5 Claims. (Cl. 223—30)

1

In applicant's copending application Serial No. 529,697 there is described a method and machine for crimping or pleating rather stiff materials. The method and machine described comprise front and back gripping means which initiate and complete the formation of bends and consequently give a start to the formation of the pleat, which is carried out by relative movement of the gripping means towards one another, so that the pleat is formed between suitable surfaces of the relatively moving parts. One detail described is an attachment to ensure the folding of the material between the gripping devices in case the tendency given by the gripping means does not do so. With the form of gripping devices used, it is usually in case of a rather deep pleat that there is any liability for this to be necessary and the attachment shown can bring a blade down to rest fairly near the centre of the material to be folded and still enable it to rise clear of the front gripping means as folding proceeds.

The present invention is concerned with crimping or pleating machines of the general kind in which gripping means are arranged to grip each end of a length of material and to approach one another to form a crimp or pleat and enables even a short bend to be initiated without the necessity for the grippers to be so formed as to ensure it.

In typical forms it is automatically operated by the movement of a gripping device, preferably the front gripping device, and its main feature is that it can always be set to engage at or about the centre of the material to be pleated, which is the best place to start the fold, and moves forward as the fold is formed into position near or against the front gripping device, where it does not interfere at all with the operation of the machine.

Thus in a machine in which the upper jaw of the front gripper opens and closes a fold-starting blade is slidably mounted in that jaw and spring pressed so that its maximum distance from the front gripper can be preset. As the gripper closes, it comes down and extends to the determined position on the material to be folded and as the back and front grippers draw together it is pushed against the spring pressure towards the front until the fold is completed and the jaw rises.

The above and other parts of the invention are illustrated by the accompanying drawings in which:

Figs. 1 to 3 are diagrams showing the operations of the parts of a machine essential to a proper understanding of the invention, Fig. 1 being a diagram showing grippers about to close on the material, preparatory to forming a crimp or pleat, Fig. 2 showing them closed and Fig. 3 showing the position when the crimp or pleat is formed,

Fig. 4 is a part sectional plan of the fold initiating device,

Fig. 5 an elevational sectional view on the line V—V of Fig. 4, and

Fig. 6 is a fragmentary elevation.

In Fig. 1 the material 1 is shown in position to be gripped by the upper jaw or bar 2 and the lower bar 3 of the front gripping device. The back gripping device is movable as a whole and is at the back of its stroke, the material 1 being about to be gripped between a sliding anvil 4 and the front end of a clamping dog 5. The blade 6 and extending stems 7 of the fold initiator are spring pressed to abut the midposition of the length of material to be crimped or plated, each of the stems 7 being slidable in a tubular housing 8 carried by the bar 2 and its position being determined by the abutment 9 at its forward end.

In Fig. 2, the grippers have closed and the blade 6 has come into position to ensure the desired initiation of the fold.

Fig. 3 shows the position when the back gripping device has completed its folding stroke. It will be observed that the blade 6, engaged at about midstroke, has been pressed forward by the back gripping device until it lies against the bar 2.

The fold initiating device is shown in detail in Figs. 4, 5 and 6, wherein the blade 6 is mounted on a pair of rods forming the stems 7. These rods pass through the bar 2 and through tubular housings 8 brazed to flanges 10 secured to the bar 2 by screws 11. A collar 12 is secured to the bar by grub screw 13 and forms an abutment for a compression spring 14. Plug 15 at the end of the tube forms a fixed abutment. As shown, the blade 6 is adjusted to reach its maximum designed extension from the bar 2. For shorter folds the movable abutment 9 formed by the head of a collet having a split portion 17 can be adjusted along the bar to the extent required. A locking nut 18 clamps the collet at any required position.

I claim:

1. A folding or pleating apparatus, comprising a pair of gripping devices, each composed of co-operating jaws for gripping the material to be folded, means for supporting said devices for

movement relative to each other to form a fold in the material, a fold initiating blade for contacting the material substantially on the line of a fold to be made, and means for slidably supporting said blade on one of the jaws of one of said gripping devices to permit the retraction of the blade as the gripping devices are moved toward each other, said means supporting said blade between said devices for movement in the path of movement of said devices to be retracted against its supporting jaw by abutment with the other of said devices when said devices are moved toward each other to form a fold in the material.

2. A folding or pleating apparatus comprising a pair of gripping devices each composed of cooperating jaws for gripping the material to be folded, means for supporting said devices for movement relative to each other to form a fold in the material, a fold initiating blade for contacting the material substantially on the line of a fold to be made, means for slidably supporting said blade on one of the jaws of one of said gripping devices to permit the retraction of the blade as the gripping devices are moved toward each other, said means supporting said blade between said devices for movement in the path of movement of said devices to be retracted against its supporting jaw by abutment with the other of said devices when said devices are moved toward each other to form a fold in the material, and means for automatically moving said blade from its supporting jaw to fold initiating position when said devices are moved apart.

3. A folding or pleating apparatus comprising a pair of gripping devices each composed of cooperating jaws for gripping the material to be folded, means for supporting said devices for movement relative to each other to form a fold in the material, a fold initiating blade for contacting the material substantially on the line of a fold to be made, means for slidably supporting said blade on one of the jaws of one of said gripping devices to permit the retraction of the blade as the gripping devices are moved toward each other, said means supporting said blade between said devices for movement in the path of movement of said devices to be retracted against its supporting jaw by abutment with the other of said devices when said devices are moved toward each other to form a fold in the material, and means for resiliently biasing said blade from its supporting jaw to fold initiating position when said devices are moved apart.

4. A folding or pleating apparatus comprising a pair of gripping devices each composed of cooperating jaws for gripping the material to be folded, means for supporting said devices for movement relative to each other to form a fold in the material, a fold initiating blade for contacting the material substantially on the line of a fold to be made, means for slidably supporting said blade on one of the jaws of one of said gripping devices to permit the retraction of the blade as the gripping devices are moved toward each other, said means supporting said blade between said devices for movement in the path of movement of said devices to be retracted against its supporting jaw by abutment with the other of said devices when said devices are moved toward each other to form a fold in the material, and resilient means cooperating with said blade supporting means and said jaw to bias said blade from said jaw to fold initiating position when said devices are moved apart.

5. A folding or pleating apparatus comprising a pair of gripping devices each composed of cooperating jaws for gripping the material to be folded, means for supporting said devices for movement relative to each other to form a fold in the material, a fold initiating blade for contacting the material substantially on the line of a fold to be made, means for slidably supporting said blade on one of the jaws of one of said gripping devices to permit the retraction of the blade as the gripping devices are moved toward each other, said means supporting said blade between said devices for movement in the path of movement of said devices to be retracted against its supporting jaw by abutment with the other of said devices when said devices are moved toward each other to form a fold in the material, and means for automatically moving said blade from its supporting jaw to fold initiating position when said devices are moved apart, and adjustable stop means cooperating with said blade supporting means and said blade supporting jaw to selectively limit the movement of said blade to a selected fold initiating position.

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