Nov. 28, 1961 F. H. GOYETTE 3,010,134

BLADE HOLDER WITH PNEUMATIC RELEASE

Filed Feb. 18, 1960

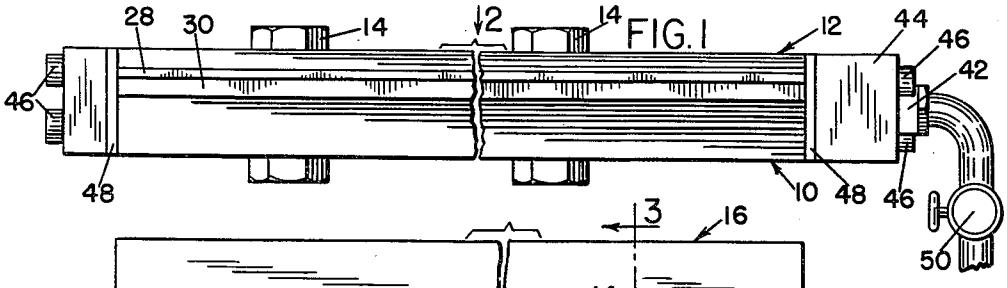


FIG. 1

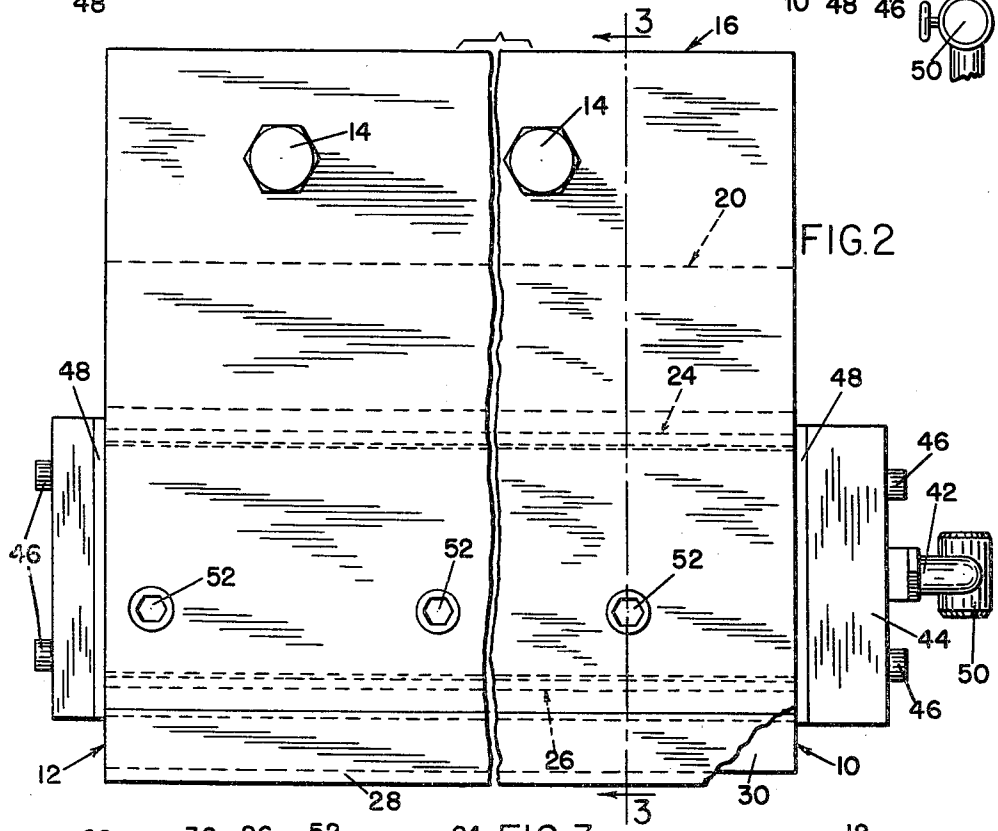


FIG. 2

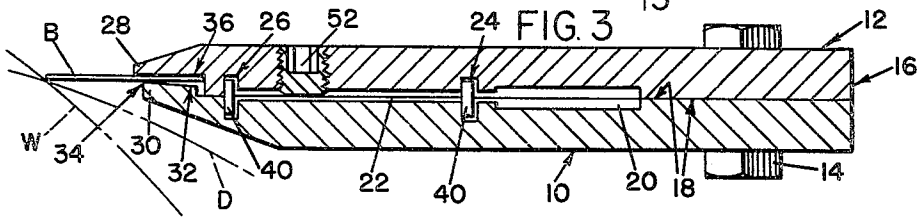


FIG. 3

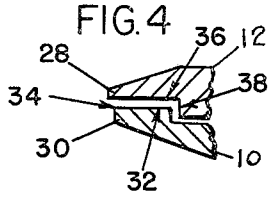


FIG. 4

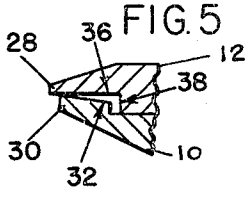


FIG. 5

INVENTOR
FRANCIS HENRY GOYETTE

by Charles R. Fay,

ATTORNEY

United States Patent Office 3,010,134 Patented Nov. 28, 1961

3,010,134
BLADE HOLDER WITH PNEUMATIC RELEASE

Francis H. Goyette, Worcester, Mass., assignor to Lodding Engineering Corporation, Auburn, Mass., a corporation of Massachusetts

Filed Feb. 18, 1960, Ser. No. 9,489
16 Claims. (Cl. 15—236)

This invention relates to a new and improved fluid pressure actuated blade holder particularly adapted for blades used for wiping and doctoring in the paper industry but not limited to such use; and the principal object of the invention is to provide a greatly simplified and better holding blade clamp having a fluid pressure actuated release so that blades may be taken out, reversed or substituted almost instantaneously, the blade-holding means or clamp being opened only by the fluid pressure, the closing of the jaws of the device being occasioned by the inherent resiliency of the metal or other material of which the blade holder itself is made, this forming an extremely powerful and accurate blade-holding means, preventing the blade from any motion in the holder and also having the extremely important function of preventing the entry of any detritus, fuzz or the like into the blade holder.

One of the great problems in the prior art with doctor and wiping blades is that as a result of operation, the paper-making rolls provide a great deal of detritus and fuzz which gets into the blade holders and hardens, and all blade-holding means for doctors and other blades have to be periodically cleaned. By providing a positive grip and a novel type of fluid pressure operated release, this invention serves to prevent the reception of such detritus.

A still further object of the invention resides in a blade holder of the class described which comprises essentially a pair of strong steel blade clamping members which are fixedly secured together at one area in such a way that at the blade-holding area thereof which is remote from the securing area they inherently apply pressure, one jaw member on the other, and by this means the blade is maintained firmly in desired position. When it is desired to open the clamping jaws, pneumatic pressure is applied between the members, forcing the same apart a slight amount but sufficient to provide for removal of an old blade and insertion of a new one, and then as soon as the pneumatic pressure is removed, the clamping jaws (blade-holding areas) return to their blade-clamping position automatically. Thus it is only necessary to utilize the power, i.e., the pneumatic pressure, when it is desired to open the jaws, and at all other times the blade is held in position merely by the powerful inherent resiliency of the blade-clamping members themselves.

The invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly set forth in the appended claims.

Reference is to be had to the accompanying drawings, in which:

FIG. 1 is a view in front elevation of the new blade holder;

FIG. 2 is a top plan view thereof;

FIG. 3 is a section on line 3—3 of FIG. 2; and

FIGS. 4 and 5 are sections showing the action of the blade holding jaws when open and closed respectively.

In carrying out this invention, the same comprises a pair of generally flat, elongated main clamping jaw members or plates and these are generally indicated at 10 and 12. These members are preferably of some strong, rigid, resilient material which will flex to a slight extent, such as steel.

These two steel members or plates are finished and are bolted flatwise together as by a series of bolts at 14

adjacent one edge of the device, as indicated at 16. As shown in FIG. 3, these plates are in flatwise contact along surfaces 18 but intermediate the longitudinal edges thereof they are provided with complementary gaps forming a chamber as at 20, a narrower chamber at 22, these chambers being connected by a relatively deep chamber 24, there being another chamber 26 corresponding to chamber 24 at the opposite end of chamber 22. As clearly shown in FIG. 5, these plates 10 and 12 are made to firmly impinge upon each other at the extreme end edge opposite the securement edge 16. The tip or edge of member 12 extends slightly beyond the corresponding tip or edge of member 10 and these tips are indicated by the reference numerals 28 and 30 respectively. As shown in FIG. 3, the tip 30 is cut back or recessed along an angle as shown at 32 so that tip 30 impinges on the blade B along a line contact 34 and there is at all times a small triangular chamber between the inclined surface 32 and the flat or "straight" surface indicated at 36 on the tip 28.

Tip 28 of member 12 continues inwardly from the area 36 in a transverse direction forming an abutment surface at 38 (FIGS. 5 and 6) against which the blade B is positioned at its inner edge. The blade B of course may be reversed when the exposed edge is worn, or it can be removed and replaced.

The two chambers 24 and 26 serve to provide for the reception of transverse sealing members indicated at 40, and the chamber 22 is an air chamber being supplied with air through a hose 42 secured into a fitting 44 bolted at 46 to the two members 10 and 12. The bolts 46 are offset so that the plates 10 and 12 are not rigidly connected adjacent the blade-clamping tips 28 and 30. In other words, the members act in the nature of a parallel bar linkage so that a slight motion to and away from each other is allowed between the members 10 and 12 at the tips in order to release the blade. It is pointed out that FIG. 4 shows the air pressure "On" and the members 10 and 12 spaced apart sufficiently to remove and apply a new blade, and in FIG. 5 the jaws are shown close together. Even when closed in this way, the jaws impinge upon each other with considerable force due to the formation of the plates 10 and 12 imparting tension one upon the other except in the region of the chambers. Fitting 44 may be provided with gasket 48 and this leaks to bleed the air when the air pressure is turned off as for instance by a conventional valve 50 in the hose 42.

In the event that it is desired to hold a relatively thick blade, the two tips 28 and 30 will of course be made so that originally they are spaced apart but with less spacing than the thickness of the blade to be held thereby.

It will be seen from inspection of FIG. 3 that the arrangement of the blade B angularly with respect to the rolls at D and W show the respective usage of the blade at a low angle with respect to the roll when used as a doctor blade and at a steeper angle when used as a wiping blade at W.

When the fluid pressure is turned on, the tips 28 and 30 are forced apart and the blade can be removed manually. When the new blade has been inserted, the pressure is merely turned off and the blade-clamping members immediately grip the blade along its length. The force to grip the blade is inherent in plates 10 and 12 and the only power needed is to open the clamping jaws, which only takes place momentarily.

In the event of power failure, the blade is clamped, not released, as in prior art power operated clamps. To release the blade in this event, mechanical means may be provided to pry the jaws apart. Such means may take the form of screws 52 located in tapped holes in one blade and turnable to impinge on the other blade and force the same apart enough to remove the blade B. These screws

are preferably located remotely with respect to fasteners 14 and adjacent the tips 28 and 30.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:

1. A blade holder comprising a plurality of members normally held in blade-clamping position, means for temporarily separating said members sufficiently to release said blade, said blade separating means comprising means for introducing fluid under pressure between said members.

2. A device of the class described comprising a plurality of article-holding members, said members being secured together, means forming a chamber between said members, means forming article-holding jaws on said members, said jaws being normally held rigidly together, and means for introducing fluid under pressure into said chamber for separating said jaws for the removal and replacement of an article.

3. A device of the class described comprising a plurality of substantially rigid resilient members fixedly secured together adjacent corresponding areas thereof, areas of said members remote from the securement area being capable of a relatively small amount of flexure for separation, said remote areas forming article-holding jaws and being normally held in clamping position by the inherent resiliency of said rigid members, means for introducing fluid under pressure between said members for retracting the jaws away from each other to an extent to release an article clamped in said jaws.

4. The device of claim 3 including means forming a chamber between said members into which the fluid under pressure is adapted to be introduced, and means providing for the release of said fluid under pressure therefrom.

5. The device of claim 3 including mechanical means for separating the jaws.

6. A device of the class described comprising a plurality of substantially rigid but resilient members, means securing the same together in flatwise contacting relationship, said means being located at a certain area thereof, a remote area of said members being unconnected and forming article-clamping jaws, said jaws being normally pressed together under the inherent resiliency of said members, means forming a chamber between said members, and means for introducing a fluid under pressure into said chamber for forcing said jaws apart to an extent to allow the article to be removed therefrom, the securement area being undisturbed under the presence of pressure in the chamber.

7. The device as recited in claim 6 wherein said chamber comprises recesses in certain of said members so that the fluid pressure impinges upon all of said members to separate the same, and sealing means adjacent one end of the chamber adjacent the jaws to prevent the fluid from escaping when the jaws become separated.

8. A device as recited in claim 6 including a gasket closing at least one end of said chamber, said gasket leaking to allow the slow escape of fluid therefrom.

9. A blade holder comprising a pair of metallic, rigid, resilient members, said members being substantially flat and being secured together in flatwise contacting relationship, means securing said members together adjacent corresponding edges thereof, the opposite corresponding edges being free of each other but inherently pressed together by the resilience of the metal members and forming blade-holding jaws which hold the blade by the inherent resiliency of said members, means for separating said jaws sufficiently to remove the blade held therein,

said means comprising means to admit or shut off the fluid under pressure between the members.

10. A device as recited in claim 9 including a fluid chamber between said members, a gasket closing at least one end of said chamber, said gasket allowing the escape of fluid therefrom when the jaws are closed.

11. A blade holder comprising a pair of substantially rigid, resilient members having the quality of permitting a slight flexure, said members being substantially flat, means securing said members together adjacent corresponding edges thereof, the opposite corresponding edges being free of each other but inherently pressed together by the resilience of the members and forming blade-holding jaws holding the blade by the inherent resiliency of said members, means for separating said jaws sufficiently to remove the blade held therein, said separating means comprising means for introducing fluid under pressure between said members, said separating means including recesses in at least one of said members forming a chamber between the members, and sealing means preventing the escape of fluid under pressure from said chamber toward the jaws.

12. A blade holder comprising a pair of substantially rigid, resilient members, said members being substantially flat and being secured together in flatwise contacting relationship, means securing said members together adjacent corresponding edges thereof, opposite corresponding edges being free of each other but inherently pressed toward each other into blade-clamping relation by the resilience of the members and forming clamping jaws holding the blade, means for separating said jaws to remove a blade held therein, said jaw-separating means comprising a source of fluid under pressure, means to admit fluid under pressure inbetween the members, and means to shut off the fluid under pressure.

13. A device as recited in claim 12 wherein one of said clamping jaws stops short of the other and is provided with a relatively inclined adjacent face so that the shorter jaw bears upon the longer jaw along a line contact at the extreme edge of the shorter jaw but inwardly of the extreme edge of the longer jaw.

14. A device for clamping a blade comprising a pair of substantially rigid inherently resilient elongated members, said members being substantially flat and contacting each other in substantially flat relationship, means fastening said members together along corresponding edges thereof leaving the opposite edges unconnected, said unconnected edges being caused to strongly impinge upon each other forming blade-holding jaws by the inherent resiliency of said members, means forming a chamber between said members, the chamber being located between the fastening means and said jaws, means for introducing fluid under pressure into said chamber for separating said jaws, sealing means between said chamber and the jaws preventing escape of the fluid, and means for turning the pressure on and off.

15. A device as recited in claim 14 wherein one jaw is shorter than the other and bears on the same in a line contact.

16. A device as recited in claim 14 including means for bleeding the fluid under pressure when the pressure is shut off from said chamber to allow the fluid to escape from said chamber and the jaws to close.

References Cited in the file of this patent

UNITED STATES PATENTS

1,449,824 Lent ..... Mar. 27, 1923