

[54] **SEAL FOR CLOSING ENDS OF STRIPS OR RIBBONS**

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[30] **Foreign Application Priority Data**

Dec. 10, 1970 Switzerland..... 18306/70

[52] U.S. Cl. .... 24/23 W, 206/65 K

[51] Int. Cl. .... B63d 63/06

[58] Field of Search ..... 24/20 W, 23 W; 206/65 K

[56] **References Cited**

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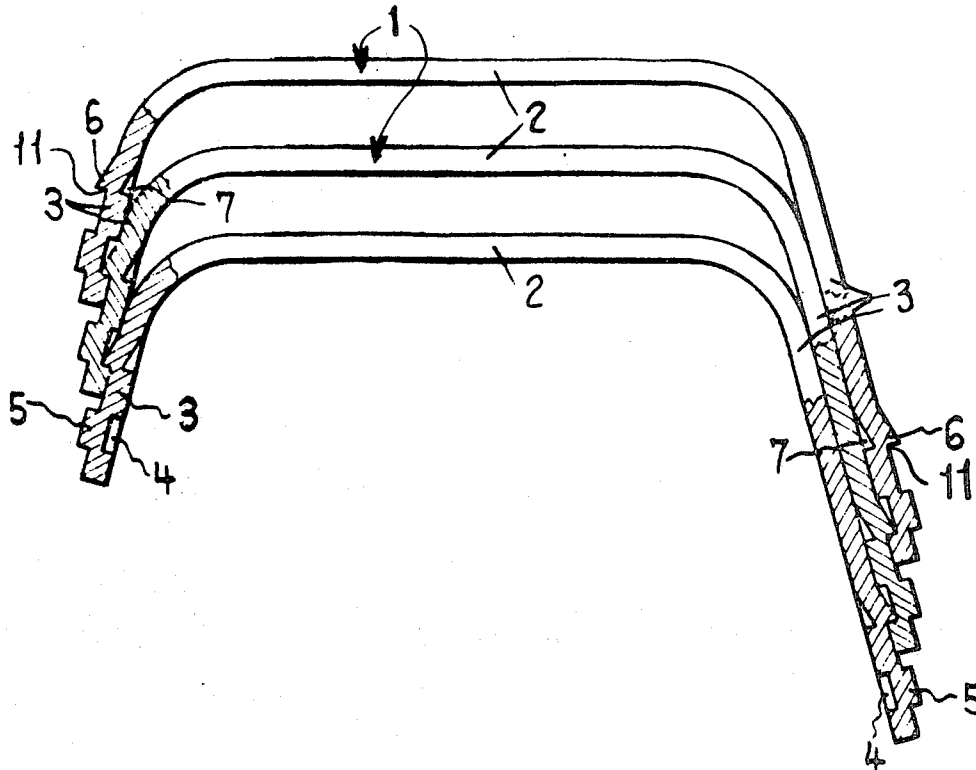
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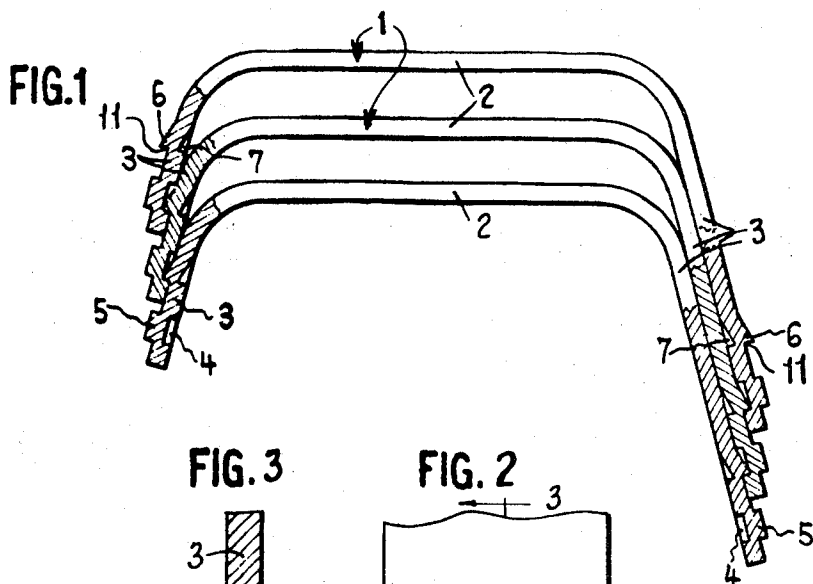
*Primary Examiner*—Donald A. Griffin  
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[57] **ABSTRACT**

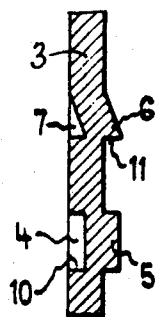
A clamp for securing together the end portions of a ribbon or strip, usually metal, bound around containers such as crates, packing cases and the like, comprises a strip, bar or plate, usually metal, of U-shaped configuration having a flat bight portion and angularly disposed arms enabling the stacking of the clamps by straddling-nesting relationship to each other for shipment and storage. The arms of the clamps are provided with latch means for releasably securing the clamps in stacked relation and the latch means comprises projections or protrusions on the outer sides of the arms for nesting in recesses or openings in the inner sides of the arms of adjacent clamps within which they are nested.

**5 Claims, 5 Drawing Figures**

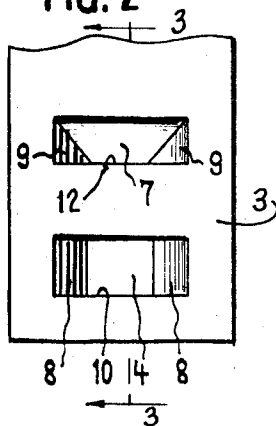




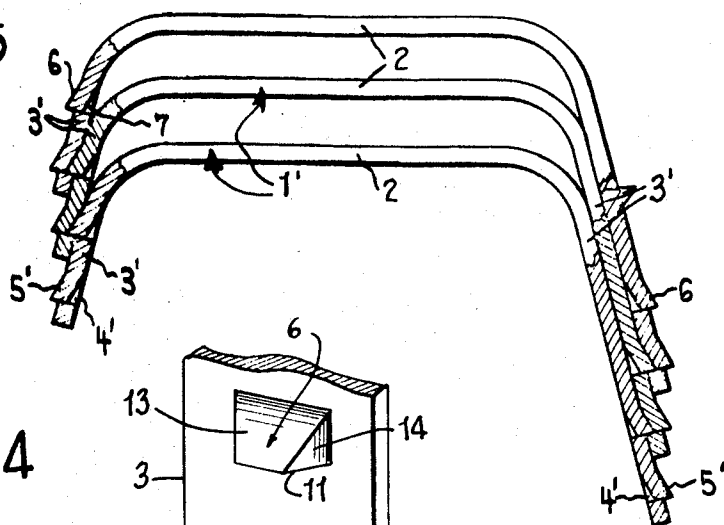
**FIG. 3**



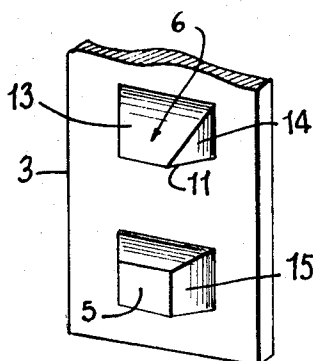
**FIG. 2**



**FIG. 5**



**FIG. 4**



INVENTOR  
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## SEAL FOR CLOSING ENDS OF STRIPS OR RIBBONS

### BACKGROUND OF THE INVENTION

Strips or ribbons, usually metal, are used for binding and reinforcing containers such as crates, packing cases, cartons and the like. After the strips are stretched taut around a container their end portions are firmly secured together by clamps composed of substantially rigid but bendable material such as metal. The clamps comprise strips, bars or plates of a general U-shaped configuration and having a flat bight portion with divergent arms disposed at obtuse angles to the bight portion.

In use, the bight portion, whose length is substantially equal to the width of the strips to be secured, is disposed transversely beneath the overlapping end portions of the strips and after the strips are pulled taut, the arms are bent over against the outer side of the strip portions to firmly clamp the end portions of the strips together. However, prior to use, for storage and shipping purposes, the clamps are stacked in straddling-nested relation to conserve space and to be disposed in dispensing position for use.

To retain the clamps in stacked relation the clamp arms are provided with latch means for cooperation with corresponding latch means on the arms of adjoining clamps astraddle or nested with any given clamp. The latch means on each arm comprises a projection adjacent the tip and extending inwardly of each arm and a socket in the outer side of each arm and spaced from the tip toward the arm connection with the bight portion. In stacked assembly, the inward projections on the arms of the astraddle clamp mates with the sockets in the arms of the nested clamp to retain the clamps together in properly spaced relation.

For simplicity and economy in manufacture, the latch means on the arms are produced by a stamping operation on the outer sides of the clamp strips. The stamping operation produces certain problems, however, that result in inefficient cooperation of the latch means. Firstly, neither the projection nor the socket have sharply defined lines so that a loose mating results and, secondly, the formation of the socket as a recess produces an inwardly directed projection opposite said recess that engages the arm of the nested clamp and prevents full mating of the latch projection with the socket recess. Thus, inefficient latching results so that the clamps can twist relative to each other and even become separated.

As a result of the undesirability of the second projection opposite the recess, either the recess must have a shallower depth, which makes reliable stacking more unlikely, or alternatively, the socket comprises a through aperture punched out of the arm instead of a recess. This is not only disadvantageous from a manufacturing point of view, but also weakens this clamp. Sharp edges may also be produced, which may cause damage to and also weakening of the strip embraced by the clamp. Similarly, the inwardly facing projections may also lead to damage or weakening of the strip.

### SUMMARY OF THE INVENTION

A clamp according to the present invention has the same generally U-shaped configuration as the prior art clamps, with latch means on the arms, but the latch means projections are on the outer sides of the arms and

spaced from the arm tips with the sockets on the inner sides of the arms adjacent the arm tips. Consequently, the arms of the outer clamp must be bent the very minimum to enable them to pass over the outwardly extending projections on the arms of the inner clamp until the sockets in the inner sides of the outer clamp arms register with and receive the projections on the inner clamp. Thus, the arms of the clamps are disposed in firm face-to-face engagement.

Moreover, the latching projections, according to the invention, have angularly disposed surfaces inclined outwardly from the arm surfaces at a point toward the arm connection with the bight portions so that the arms of the straddling clamp can slide by a cam action over the projections on the nested clamp without difficulty and thereby avoid any deformity produced by bending. The inclined projection walls terminate in surfaces substantially perpendicular to the arm surfaces and abut like surfaces in the sockets to prevent inadvertent pulling apart of stacked clamps.

To facilitate separation of the stacked clamps, as a clamp is required, the side walls of the projections and sockets are divergently inclined to function as cams. Thus, lateral pressure on a clamp will cause a cam action between the inclined side walls to force the clamp arms apart sufficiently to free the projections from the sockets and enable removal of the clamp.

### BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a side elevational view of a stack of clamps according to the invention, the arms being shown in cross-section to illustrate the cooperation of the latch means for retaining the clamps in a stack;

FIG. 2 is an enlarged elevational view of the inner side of a clamp arm as shown in FIG. 1 and illustrating the latch socket and recess therein;

FIG. 3 is a cross-sectional view taken on line 3—3 of FIG. 2;

FIG. 4 is a perspective view of the outer side of the arm portion shown in FIG. 2, and

FIG. 5 is a view similar to FIG. 1 but showing modified latch means.

Referring now to the drawings in detail, specifically to FIG. 1, a plurality of clamps 1, in accordance with the present invention are shown in stacked relation. These clamps comprise a plate, strip or bar of a generally U-shaped configuration and are formed of substantially rigid but bendable material, preferably metal, and specifically steel although other metals or materials can be employed. The clamps include a flat bight portion 2, which are of a length substantially equal to the width of the tapes that they are to bind together, with divergent arms 3, disposed at an obtuse angle to the bight portion, to enable the clamps to be stacked with one clamp astraddle another, or conversely, one nested within another.

The arms 3 each include latch means and may be identical although there may be a difference in length as to the respective arms on opposite sides of the bight portion. If the clamp comprises a strip, only one set of latch means are provided on each arm, but if the clamp comprises a plate, a plurality of side-by-side latch means may be provided.

The latch means as shown in FIG. 1, comprises a socket 4 in the inner side of each arm and adjacent the tip of the arm. This socket may be a through opening or it may be a recess resulting in a projection 5, on the

outer side of the arm. Cooperative latch means comprises a projection 6 extending from the outer side of the arm and spaced from the location of the socket 4 toward the connection of the arm with the bight portion.

The sockets and projections may be formed by a stamping process which results in the projection 5, opposite the socket 4, and a recess 7, opposite the projection 6. Alternatively, the socket 4, may comprise a through opening in which the material is punched therefrom. In this latter event any rough edges or the like from the punching operation are disposed on the outer side of the arms and will not affect the eventual clamping of the ribbons together.

The projections 6 are wedge shaped as viewed from the side, each having an outer upper surface 13 that is inclined from the outer surface of the arms 3 to define a ramp terminating in a locking surface 11, which is substantially perpendicular to the outer surface of the arms 3. Thus, in assembling the clamps the outer clamp may be pressed over the inner clamp or vice versa and the tip end portions of the arms of the outer clamp will slide over the inclined ramp surfaces 13, until the recesses 4 register with the projection 6, and the projections snap into such recesses with their perpendicular locking surfaces 11, engaging perpendicular locking surfaces 10 in the recesses.

This assembly of the clamps in a stack is very simple and the arms do not have to be pried or bent apart to enable the projections or recesses to pass over intervening locking means to seat in the outer facing sockets of the prior art clamps. These clamps are not necessarily resilient and excess bending can deform the arms so that they may fail to accommodate stacking relations. The outwardly extending projection 5, can serve as a stop or abutment to limit the nesting of one clamp within the other.

The firm engagement of the perpendicular surfaces 10 and 11, precludes direct separation of the clamps by pulling them apart in the plane of the stack. However, the projections 6 and sockets 4 both are provided with angularly disposed side walls which cooperate to effect a camming action to withdraw the projection from the socket within which it is seated when one clamp is forced laterally of the cooperative clamp. Thus, the projections 6 have inclined outer side walls 14 which engage inclined inner side walls 8 within the sockets 4, so that these walls are engaged and the least lateral movement will tend to unseat the projections from the sockets. As a result of the pressing operation the recess 7, opposite the projection 6, has inclined inner side walls 9 and a flat bottom wall 12 opposite the perpendicular wall 11, and the projection 5 opposite the recess wall 4 has outer inclined side walls 15 opposite the inner cam walls 8.

The sockets in the end portions of the arms need not be restricted to the type illustrated in FIG. 1 but may comprise modifications as long as they are of a configuration for cooperation with the projections 6. Thus, in FIG. 5, the sockets 4' are shown as recesses resulting in projections 5' which correspond to the projections 6 in configuration. The sockets 4' correspond in configuration to the recesses 7, opposite the projections 6. As

a result, the clamps 1' have the flat bight portions 2, and the arms 3' are provided with the outward projections 6 and, in addition, have corresponding or similar projections 5' resulting from the recesses 4'.

I claim:

1. A clamp for securing binding strips or ribbons around containers comprising a flat platelike member of substantially rigid but bendable material and having a generally U-shaped configuration with a flat bight portion and divergent arms, and latch means on said arms for cooperation with corresponding latch means on like clamps to retain a plurality of such clamps in stacked straddling-nested relation, said latch means on each arm including a coupling socket in the inner side adjacent the tip of each arm, and a coupling projection on the outer side of each arm and spaced longitudinally of said arm toward said bight portion, said coupling projection adapted to engage said coupling socket from the inner side when clamps are in stacked straddling-nested relation, a second projection on the outer surface of each arm opposite said coupling socket and formed by material displaced from said coupling socket, and there being a recess in the inside of each arm opposite said coupling projection and formed by displaced material in forming said coupling projection, said second projection formed opposite said coupling socket extending freely outwardly when the clamps are in stacked straddling-nested relation.

2. A clamp according to claim 1 wherein said projections are wedge shaped and each have an upper surface inclined outwardly from the outer surface of said arm.

3. A clamp according to claim 1 wherein said projections and sockets each have mutually engaging divergently inclined side walls for camming said arms of straddling-nested clamps apart to unseat said projections from said sockets by lateral pressure on one clamp relative to the other.

4. A clamp for securing binding strips or ribbons around containers comprising a flat plate-like member of substantially rigid but bendable material and having a generally U-shaped configuration with a flat bight portion and divergent arms, and latch means on said arms for cooperation with corresponding latch means on like clamps to retain a plurality of such clamps in stacked straddling-nested relation, said latch means on each arm including a socket in the inner side adjacent the tip of each arm, and a projection on the outside of each arm and spaced longitudinally of said arm toward said bight portion, said projections being wedge shaped and each having an upper surface inclined outwardly from the outer surface of said arm, said projections each having a lower outer locking surface substantially perpendicular to said arm, and each socket having a lower inner surface perpendicular to said arm for abutment with said perpendicular projection surface.

5. A clamp according to claim 4 wherein said projections and sockets each have mutually engaging divergently inclined side walls for camming said arms of straddling-nested clamps apart to unseat said projections from said sockets by lateral pressure on one clamp relative to the other.

\* \* \* \* \*

UNITED STATES PATENT OFFICE  
CERTIFICATE OF CORRECTION

Patent No. 3,750,239 Dated August 7, 1973

Inventor(s) Rudolf Styner

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

IN THE HEADING:

Address of Assignee, Strapex A.G. should be --

Wohlen

Assignee's name is Strapex, A.G.

Signed and sealed this 1st day of January 1974.

(SEAL)  
Attest:

EDWARD M. FLETCHER, JR.  
Attesting Officer

RENE D. TEGTMEYER  
Acting Commissioner of Patents