

CPC**COOPERATIVE PATENT CLASSIFICATION****B31F**

MECHANICAL WORKING OR DEFORMATION OF PAPER OR CARDBOARD (cutting, trimming, in general [B26](#); incising, scoring, in general [B26D 3/08](#); making layered products not composed wholly of paper or cardboard [B32B](#); multi-ply material of paper or cardboard, its manufacture [D21H](#))

B31F 1/00

Mechanical deformation of paper or cardboard without removing material including combined deformation and laminating (embossing combined with application of ink, type marking presses, selective embossing machines [B41F](#), [B41J](#), [B41K](#), [B41M](#); machines or apparatus for embossing decorations or marks [B44B 5/00](#); artists hand tools for embossing [B44B 11/04](#); producing decorative effects by processes for stamping ornamental designs on surfaces [B44C 1/24](#); mechanical deformation during paper or board making, kinds of paper or board [D21](#))

B31F 1/0003

. {Shaping by bending, folding, twisting, straightening, flattening or rim-rolling; Shaping by bending, folding or rim-rolling combined with joining; Apparatus therefor ([shaping of tube ends B31F 1/008](#))}

B31F 1/0006

.. {Bending or folding; Folding edges combined with joining; Reinforcing edges during the folding thereof; (creasing [B31F 1/08](#), crêping paper [B31F 1/12](#), corrugating [B31F 1/20](#); bending and joining [B31F 1/0045](#); Reinforcing edges per se [B31F 5/08](#); making wound articles [B31C](#), folding thin material per se [B65H 45/00](#))}

B31F 1/0009

... {of plates, sheets or webs}

B31F 1/0012

.... {combined with making folding lines ([B31F 1/0022](#) takes precedence)}

B31F 1/0016

.... {Folding edges; Folding edges combined with joining; Reinforcing edges during the folding thereof, e.g. by introducing a thread; Folding the edges of a sheathing ([B31F 1/0029](#) takes precedence)}

B31F 1/0019

.... {the plates, sheets or webs moving continuously ([B31F 5/08](#) takes precedence)}

B31F 1/0022

..... {combined with making folding lines}

B31F 1/0025

..... {Making the folding lines using rotary tools}

B31F 1/0029

..... {Folding edges; Folding edges combined with joining; Reinforcing edges during the folding thereof, e.g. by introducing a thread; Folding the edges of a sheathing}

B31F 1/0032

... {of tubes}

B31F 1/0035

.. {Straightening or flattening}

B31F 1/0038

.. {Rim-rolling}

B31F 1/0041

... {combined with joining}

B31F 1/0045

.. {Bending or folding combined with joining ([Folding edges combined with joining B31F 1/0016](#), [B31F 1/0029](#))}

B31F 1/0048

... {Bending plates, sheets or webs at right angles to the axis of the article being formed and joining the edges}

B31F 1/0051

.... {for making articles of definite length}

B31F 1/0054

..... {using internal forming surfaces, e.g. mandrels}

B31F 1/0058

..... {Machines therefor having additional mandrels, e.g. mounted on a turntable, or on chains ([B31F 1/0064](#) takes precedence)}

- B31F 1/0061 {for making articles of indefinite length}
- B31F 1/0064 {using internal forming surfaces, on e.g. mandrels}
- B31F 1/0067 {using only external forming surfaces, e.g. sleeves}
- B31F 1/007 {for making articles with multilayered walls}
- B31F 1/0074 {Making essentially non-hollow profiles, e.g. rods, ropes, cords}
- B31F 1/0077 . {Shaping by methods analogous to moulding, e.g. deep drawing techniques}
- B31F 1/008 . {Shaping of tube ends, e.g. flanging, bellling, closing, rim-rolling, corrugating; Fixing elements to tube ends}
- B31F 1/0083 . . {Closing}
- B31F 1/0087 . . {Rim-rolling}
- B31F 1/009 . . . {combined with joining, e.g. for fixing a closure element}
- B31F 1/0093 . . {Fixing elements to tube ends}
- B31F 1/0096 . {Lining or sheathing (folding the edge of the sheathing [B31F 1/0016](#), [B31F 1/0029](#))}
- B31F 1/07 . Embossing, {i.e. producing impressions formed by locally deep-drawing, e.g. using rolls provided with complementary profiles} ({[B31F 1/128](#) takes precedence;} corrugating [B31F 1/20](#))
- B31F 1/08 . Creasing (corrugating [B31F 1/20](#); zig-zag folding [B65H 45/20](#)) { (combined with folding [B31F 1/0012](#), [B31F 1/0022](#); grooving by cutting [B26D 3/06](#), [B26D 3/08](#); by milling grooves [B23C 3/30](#); of plastics material [B29C 53/06](#))}
- B31F 1/10 . . by rotary tools
- B31F 1/12 . Crêping paper or cardboard {, i.e. providing paper or cardboard with small irregular crinkles; Making paper or cardboard elastic in all directions}
- B31F 1/122 . . {the paper being submitted to an additional mechanical deformation other than crêping, e.g. for making it elastic in all directions}
- B31F 1/124 . . {Multiple crêping, e.g. forming crêpes under different angles}
- B31F 1/126 . . {including making of the paper to be crêped}
- B31F 1/128 . . {Making paper elastic in all directions, other than by crêping ([B31F 1/122](#) takes precedence)}
- B31F 1/14 . . by doctor blades arranged crosswise to the web
- B31F 1/145 . . . {Blade constructions}
- B31F 1/16 . . by elastic belts ({[B31F 1/18](#) takes precedence})
- B31F 1/18 . . by tools arranged in the direction of web feed; {Logitudinal crêping, i.e. providing paper with crêpes parallel to the direction of web movement, e.g. for making paper elastic transversely to this direction}
- B31F 1/20 . Corrugating; Corrugating combined with laminating to other paper or cardboard layers ({corrugating sheet metal [B21D 13/00](#); corrugating plastics material [B29C 53/22](#);} corrugating veneer [B27D](#))
- B31F 1/205 . . {Corrugating tubes (corrugating tube ends [B31F 1/008](#); Making tubes, not otherwise provided for, [B31F 7/004](#); Corrugating metal tubes [B21D 15/00](#))}
- B31F 1/22 . . Making webs in which the channel of each corrugation is longitudinal with the web feed
- B31F 1/225 . . . {combined with uniting the corrugated web to flat webs; Making corrugated-web structures}
- B31F 1/24 . . Making webs in which the channel of each corrugation is transverse to the web feed

B31F 1/242	...	{the corrugations being obliquely inclined to the web feed (B31F 1/247 , B31F 1/30 take precedence)}
B31F 1/245	...	{by feeding the webs in a channel larger than the thickness of the webs by means of rollers, e.g. involving prefolding}
B31F 1/247	...	{by reciprocating members}
B31F 1/26	...	by interengaging toothed cylinders {cylinder constructions (B31F 1/242 takes precedence)}
B31F 1/28	....	combined with uniting the corrugated webs to flat webs; {Making double-faced corrugated cardboard}
B31F 1/2804	.....	{Methods}
B31F 1/2809	.....	{characterised by the chemical composition of the glue}
B31F 1/2813	.....	{Making corrugated cardboard of composite structure, e.g. comprising two or more corrugated layers}
B31F 1/2818	.....	{Glue application specially adapted therefor}
B31F 1/2822	.....	{involving additional operations}
B31F 1/2827	.....	{Edge treatment}
B31F 1/2831	.....	{Control}
B31F 1/2836	.....	{Guiding, e.g. edge alignment; Tensioning}
B31F 1/284	.....	{Warp prevention}
B31F 1/2845	.....	{Details, e.g. provisions for drying, moistening, pressing}
B31F 1/285	.....	{Heating or drying equipment}
B31F 1/2854	.....	{Means for keeping the sheet in contact with one of the corrugating rollers after corrugating, but before applying the facer sheet, e.g. by air pressure, suction or pressing fingers}
B31F 1/2859	.....	{Pressing fingers}
B31F 1/2863	.....	{Corrugating cylinders; Supporting or positioning means therefor; Drives therefor}
B31F 1/2868	.....	{Exchangeable corrugating cylinders (means for changing cutting members in shearing devices B23D 35/008)}
B31F 1/2872	.....	{Spraying devices, e.g. for moistening purposes; Lubricating devices}
B31F 1/2877	.....	{Pressing means for bringing facer sheet and corrugated webs into contact or keeping them in contact, e.g. rolls, belts}
B31F 1/2881	.....	{for bringing a second facer sheet into contact with an already single faced corrugated web}
B31F 1/2886	.....	{Additionally reinforcing, e.g. by applying resin or wire}
B31F 1/289	.....	{from discrete sheets}
B31F 1/2895	.....	{from corrugated webs having corrugations of particular shape}
B31F 1/29	...	by making use of rods, e.g. co-operating with a toothed cylinder {combined with uniting the corrugated web to flat webs (B31F 1/30 takes precedence)}
B31F 1/30	...	Tools secured to endless chains {e.g. toothed belts; combined with uniting the corrugated web to flat webs}
B31F 1/305	....	{with sets of interengaging tools each secured to endless chains}
B31F 1/32	..	Corrugating already corrugated webs

- B31F 1/36 . Moistening and heating webs to facilitate mechanical deformation and drying deformed webs {(during corrugating B31F 1/28)}

B31F 5/00 **Attaching together paper or cardboard sheets, strips, or webs; {(or other preformed paper articles joining by rim-rolling B31F 1/0041, B31F 1/009; closing tube ends by inserting an element B31F 1/008, making boxes B31B)} Reinforcing edges of paper or cardboard** (means for applying adhesive or glue B05C; stapling in box or like making B31B; attaching the replacement web to the expiring web during web-roll changing B65H 19/18; apparatus for splicing webs during handling B65H 21/00)

- B31F 5/001 . {by stapling or riveting}
- B31F 5/003 . {by stitching}
- B31F 5/005 . {by folding (rim-rolling B31F 1/0041)}
- B31F 5/006 . {using a strip, e.g. profiled (B31F 5/06 takes precedence)}
- B31F 5/008 . {by friction, e.g. obtained ultrasonic vibrations}
- B31F 5/02 . by crimping or slotting {or perforating}
- B31F 5/022 .. {using a rotary tool}
- B31F 5/025 .. {by slotting}
- B31F 5/027 .. {by perforating, e.g. by folding over the partially cut part}
- B31F 5/04 . by exclusive use of adhesives
- B31F 5/06 . by adhesive tape
- B31F 5/08 .. for reinforcing edges; {Applying a strip or tape to an edge, e.g. for decorating, for protecting}
- B31F 5/085 ... {combined with folding the strip around the edge, or applying an already folded strip on (folding edges B31F 1/0016, B31F 1/0029)}

B31F 7/00 **Processes for working paper or cardboard not otherwise provided for**

- B31F 7/002 . {tubular articles, e.g. changing the cross-section}
- B31F 7/004 . {Making tubes}
- B31F 7/006 . {edges, e.g. sheet edges}
- B31F 7/008 . {Repairing}
- B31F 7/02 . Breaking the coating on paper or cardboard

B31F 2201/00 **Mechanical deformation of paper or cardboard without removing material**

- B31F 2201/07 . Embossing (not used)
- B31F 2201/0702 .. by tools working discontinuously
- B31F 2201/0705 ... Hand operated
- B31F 2201/0707 .. by tools working continuously
- B31F 2201/071 ... Type and characteristics of the embossing tools (not used)
- B31F 2201/0712 Other than rollers, e.g. belts, plates
- B31F 2201/0715 Rollers
- B31F 2201/0717 Methods and means for forming the embossments
- B31F 2201/072 Laser engraving
- B31F 2201/0723 Characteristics of the rollers

B31F 2201/0725	.....	Hardness
B31F 2201/0728	.....	Material
B31F 2201/073	.....	Rollers having a multilayered structure
B31F 2201/0733	.....	Pattern
B31F 2201/0735	.....	Pattern inclined with respect to the axis of the roller
B31F 2201/0738	.....	Cross sectional profile of the embossments
B31F 2201/0741	.....	Roller cooperating with a non-even counter roller
B31F 2201/0743	.....	having a matching profile
B31F 2201/0746	.....	and having a self-centering profile
B31F 2201/0748	.....	having a dissimilar profile
B31F 2201/0751	.....	and having a self-centering profile
B31F 2201/0753	.....	Roller supporting, positioning, driving means
B31F 2201/0756	..	Characteristics of the incoming material, e.g. creped, embossed, corrugated
B31F 2201/0758	..	Characteristics of the embossed product
B31F 2201/0761	...	Multi-layered
B31F 2201/0764	....	the layers being nested
B31F 2201/0766	....	the layers being superposed tip to tip
B31F 2201/0769	....	the layers being shifted
B31F 2201/0771	..	Other aspects of the embossing operations
B31F 2201/0774	...	Multiple successive embossing operations
B31F 2201/0776	...	Exchanging embossing tools
B31F 2201/0779	..	Control
B31F 2201/0782	..	Layout of the complete embossing machine, of the embossing line
B31F 2201/0784	..	Auxiliary operations
B31F 2201/0787	...	Applying adhesive
B31F 2201/0789	...	Joining plies without adhesive
B31F 2201/0792	...	Printing
B31F 2201/0794	...	Cutting
B31F 2201/0797	...	Perforating