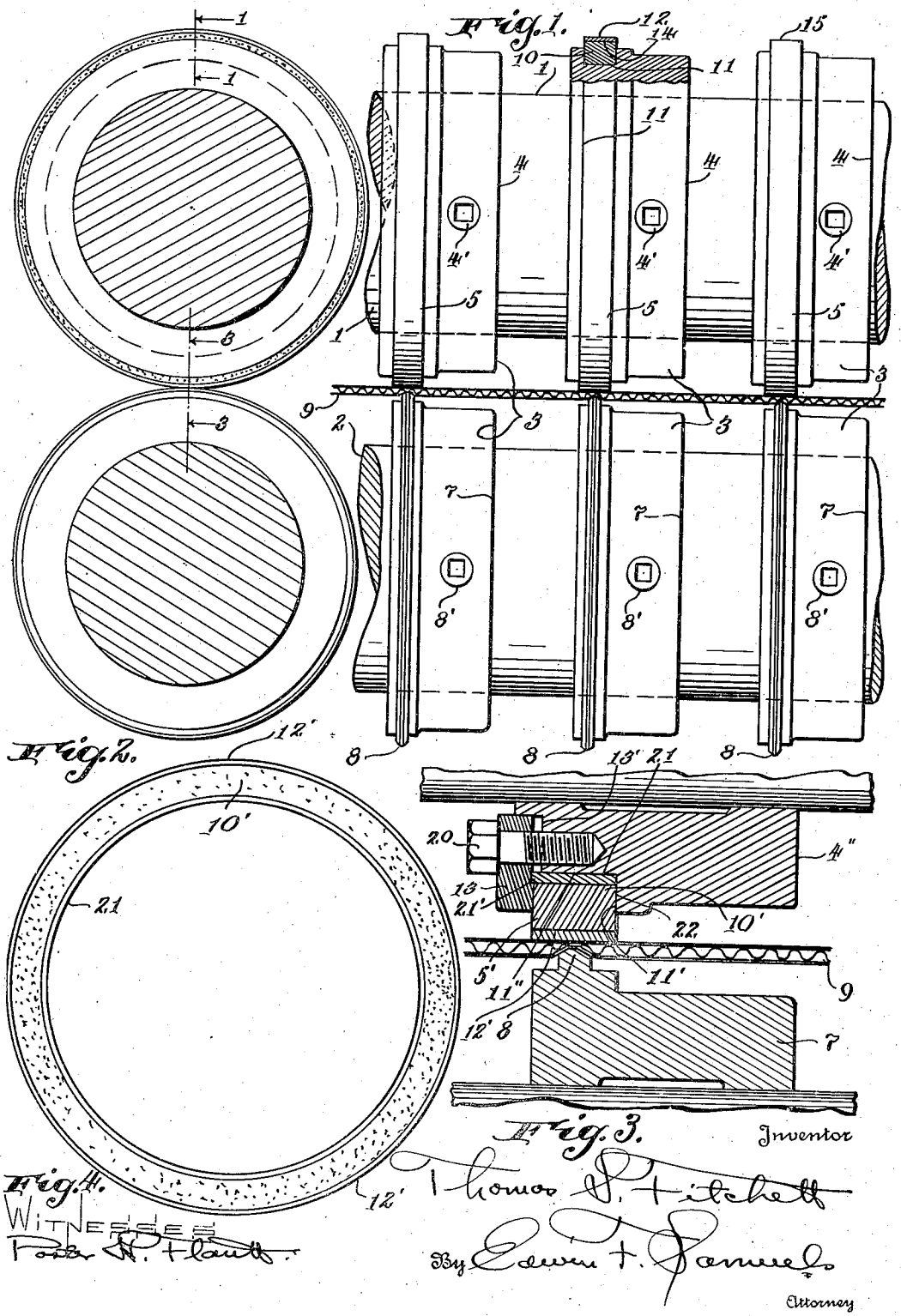
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CREASER

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CREASER

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The invention relates to an apparatus for creasing box blanks to define the fold lines at the corners and at the hinges of the top and bottom flaps, and for other creasing operations. It has particular reference to the creasing members which support and/or engage the paper, paper board, corrugated board or the like during the creasing operation in opposition to the creasers or creasing knives or other creaser members.

The prior patented art contemplates the use of rolls of various types to support the material in opposition to the scoring or creasing knives. These include solid metal rolls with yielding blocks, rubber rolls and rubber rings. None of these are entirely satisfactory as to the production of uniformly defined creases without undue weakening of the material, as to the length of efficient operative life of the creaser members, cost and maintenance of the creaser members, convenience of replacement, original cost, etc.

The purpose of the invention is to overcome these and other difficulties of the prior art by the production of a new type of creaser member which is simpler in construction and easier to maintain and replace than are those of the prior art and which is flexible in its operation, providing a yielding element in one or both creasing members so that the pressure applied to the material at all times in operation is definitely limited and uniform, avoiding undue weakening of the material. At the same time the creases produced are well defined, regular and without variation, and injury to the creaser knife is avoided. The yielding element is of simple construction and of small original cost, and cheap and easy to replace.

The improved creaser member consists of a metal ring, or tread, which is permanently attached as by vulcanizing to a rubber support or base which in the form shown is a rubber ring, adapted to be vulcanized in and to a groove in the creaser head or in another form to be clamped in a groove in the head for easy and convenient removal and replacement.

In the accompanying drawing I have illustrated an embodiment of my invention in the preferred and in a modified form.

In the drawing:

Figure 1 is an elevation of three creaser units in the preferred form showing the upper and lower creaser shafts fragmentarily with three heads on each shaft, one for each unit, the center upper head having the creaser member thereon being broken away at the top and showing the creaser member in section in a radial plane of the axis indicated by line 1, 1 in Figure 2.

Figure 2 is a side elevation looking from the left in Figure 2, the shafts being shown in section.

Figure 3 is a fragmentary section on line 3, 3 in Figure 2 on a larger scale showing a modification.

Figure 4 is a view looking from the left in Figure 3 showing this modification of the creaser member removed from the head.

Referring to the drawing by numerals, each of which is used to indicate the same or similar parts in the different figures, the construction shown comprises upper and lower creaser shafts 1 and 2. These are driven in any suitable manner in rotation or oscillation about their axes and in accordance with the existing practice they would be geared together to move simultaneously and at the same speeds. Each creaser unit 3 consists of an upper head 4 on shaft 1 and a corresponding lower head 7 on shaft 2. The upper shaft 1 carries upper creaser heads 4 concentric therewith and spaced laterally, i. e., along the shaft in accordance with the desired spacing of the creases to be formed. These heads may be moved along the shaft and clamped in any position of adjustment by any suitable means as bolts 4' to provide for change on the spacing of the creases. The heads 4 carry secured thereto concentric with the shaft axis creaser members 5 shown in the form of creasing rings to be further described. The creaser heads 7 each corresponding to one of the heads 4 on shaft 1 carry each a creaser member 8 shown in the form of ring knives concentric with the shaft 2.

The heads 7 are provided with any suitable clamping means as bolts 8' and are adapted to be moved along the shaft and clamped in various positions of adjustment.

In the operative position of the creaser heads, the creaser members 8 of the heads 7, on the lower shaft 2, register with the creaser member 5 of heads 4 on the upper shaft, as shown in Figure 1. In the drawing the creaser members are in operative engagement with the paper board 9, shown as double face corrugated board, in creasing position between the creaser members 5 and 8.

The invention relates particularly to the creaser members, which in the assembly, Figures 1 and 2, are shown as the upper creaser members being carried by the heads 4, which are on the upper shaft 1, the matter of placing them on the upper or lower shaft being a matter of arbitrary election not essential to the result produced, the terms upper and lower being used for convenience

to describe the drawing. The creaser members 5, Figures 1 and 2, consist each of a rubber ring or base 10 which is secured in a groove 11 in the head in any suitable manner. The term "rubber" is used to designate rubber or any of the various rubberlike compositions suitable to the purpose in hand. In the form shown in Figure 1 the ring 10 has been secured in the groove 11 by vulcanization or cementation, its side and bottom surfaces being thus attached to the metal of the head. Instead of using the peripheral surfaces of the rubber ring as a support for the material in opposition to the corresponding knife, however, a metal face ring or tread 12 which encircles the rubber ring 10 is employed. This has an inner peripheral surface 14 shown as flat in a lateral direction. This surface which may be of any convenient contour to conform to the rubber or vice versa, is secured to the outer surface of the rubber ring 10. In the present instance vulcanization is found to be the most convenient and satisfactory method of securing the metal face or tread ring 12 to the rubber supporting ring or base 10.

The tread or face ring 12 is preferably of the same width as the rubber base ring 10 or it may be of slightly less width to avoid contact with the sides of the groove when the rubber yields in response to creasing pressure. The width of the tread or face 12 is otherwise determined by the extent to which it is found necessary to support the material at the sides of the knife 8.

While the outer surface 15 of each metal tread ring 12 is shown as flat, these outer surfaces may be of any suitable contour to cooperate with the corresponding knives 8 or other creaser member. The rubber base 10 serves as a resilient support for the upper or for either creasing element, knife or support of the creaser units 3.

Figure 3 shows a modified form of creaser member which is adapted for convenient removal and replacement. The creaser head in this instance is indicated by reference character 4'' and the creaser member 5' is secured in a groove 11', one axial end side of which is formed by and of a removable flange ring 13. This flange ring 13 is held in a rabbetted seat 13' by means of screw bolts 20. The creasing member 5' comprises a rubber base ring 10' as in the previous instance. This base ring 10' is, however, vulcanized to metal seat ring 21 which is of short cylindrical form. The seat ring 21 is encircled by and is secured to the inner periphery of the base ring 10'. The two rings 10' and 21 are of nearly the same width in the direction of the axis. If desired, the rubber ring may be a bit narrower providing a shoulder 21' at the peripheral edge of the assembled ring.

The creaser member 5' also comprises a face ring or tread 12' which as shown encircles the external periphery of the base ring, being vulcanized thereto or otherwise secured as may be preferred. Thus, the seating ring 21 and the face ring 12' are parallel and concentric having their corresponding axial end surfaces in substantially the same radial planes at right angles to the axis. Both said rings 21 and 12' are circular and between them is the base ring 10' to which each of the rings 21 and 12' is secured on opposite sides, one to the outer and the other to the inner peripheral surface of the rubber base ring 10'. To seat the creasing member 5' the flange ring 13 having been removed, the creasing member is passed over the end of the head into the groove 11', the seating ring 21 closely overlying the bottom 11'' of the groove 11'. It is preferably wider than said bottom 11'', so that when the flange ring is forced home by tightening the screws 20, the seating ring 21 is clamped tightly between flange ring 13 and the side wall 22 of the groove 11'.

The creasing member 5' including seating ring 21, base ring 10' and face ring 12 may be either solid and continuous to be seated as described and shown in Figures 3 and 4 or the seating ring 21 and tread ring 12' may be split at each end of a long diameter, and the base ring 10' may be split at one end of said diameter so that the creaser member 5' may be opened and passed over the shaft into said groove 11' and thus clamped as described.

The outer metal tread or face rings 12 and 12' which may be also referred to as creaser rings, being thus yieldingly supported by the rubber base rings, 10, 10', secured in any suitable manner, a uniform pressure determined by the point of yielding or the rubber is applied to the paper as it is passed between the upper or supporting rings or creaser members 5 and 5' of any desired shape, and the lower members 8.

I have thus described a preferred and a modified form of the creasing member of the invention, the description being specific and in detail in order that the manner of constructing, applying, operating and using the invention may be fully understood, however, the specific terms herein are used in a descriptive rather than in a limiting sense, the scope of the invention being defined in the claims.

What I claim as new and desire to secure by Letters Patent is:

1. A creaser member for creasing corrugated board and the like in the manufacture of box blanks, the creaser member being adapted to engage the paper being creased in opposition to a creaser knife, said member consisting of a rubber supporting or base ring secured to a creaser head concentrically therewith, the rubber ring having two opposite axial end surfaces and the creaser head having rigid means supporting said surfaces, and a metal face ring having its inner periphery secured to the outer periphery of said rubber ring whereby the metal ring is resiliently supported on the head.

2. A creaser ring for use in opposition to a creasing knife in creasing corrugated board and the like in the manufacture of box blanks, the creaser ring comprising a rubber ring vulcanized to a creaser head, the rubber ring having axial end surfaces and the creaser head having supporting means therefor, and a metal face ring having its inner peripheral surface vulcanized to the outer surface of the rubber ring whereby the two rings are secured in concentric arrangement, the metal ring being resiliently supported by the rubber, the outer surface of the metal ring being adapted to engage one surface of the material being creased in opposition to said knife which engages the other side of said material.

3. A creaser member for creasing corrugated board and the like in the manufacture of box blanks, the creaser member being adapted to be secured in operative position on a creaser head, said member consisting of a seating ring and a face ring both of relatively hard stiff material and a base ring of rubber, to the inner and outer peripheries of which rubber ring said first and second mentioned rings are respectively secured, the seating ring being adapted for clamping to the head.

4. A creaser member for creasing corrugated

board and the like in the manufacture of box blanks, the creaser member being adapted to be secured in operative position on a creaser head, said member consisting of a rubber base ring, a metal seating ring and a metal face ring, the seating ring being vulcanized to the inner periphery and the face ring to the outer periphery of said rubber ring and the seating ring being adapted to be fastened to the head to hold the member in operative position in relation to the head, the face ring being adapted to engage the paper on one side in opposition to another creasing member engaging the other side of the paper.

5. The combination with a peripherally grooved creaser head for use in the creasing of corrugated and similar board in the manufacture of box blanks, of a rubber base secured in said groove, the side walls of the groove providing rigid supporting means for the axial end surfaces of the rubber ring, and a metal face resiliently supported on said base in operative relation to said base.

6. The combination with a creaser head for use in the creasing of corrugated and similar board in the manufacture of box blanks, of a creaser member comprising a rubber base ring, a metal seating ring secured to said base with its outer periphery contacting the inner periphery of the base and a metal face ring also secured to the base and having its inner periphery contacting the outer periphery of the base and means for clamping the seating ring to the base.

7. In a machine for creasing corrugated board and the like in the manufacture of box blanks, the combination with a rotary creasing knife and a shaft therefor of a metal creasing ring adapted to bear on the paper in opposition to said knife, a rotary creasing shaft and a resilient rubber ring supporting said metal ring on said shaft.

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