This invention relates to improvements in paper crimping device, and more particularly to machines for fastening sheets of paper together by passing them between inter-meshing crimping wheels which are to impress a narrow line of crimping along one or more edges, thereby accomplishing in a more or less permanent manner what is usually accomplished by the use of metal fasteners, rivets, and the like, the fastening being what may be termed semi-permanent in that the sheets can be parted with but slight mutilation.

The object of the invention is to provide an improved construction for devices of the character described, and more particularly of the type disclosed in an application for United States Letters Patent filed December 31, 1931, bearing Serial No. 554,163, the improvement consisting primarily in substituting an automatic or spring adjustment for one of the two crimping wheels to replace the manual adjustment heretofore used, and to otherwise strengthen those parts subject to stress and consequent breakage.

A preferred embodiment of my invention is disclosed in the accompanying drawing, in which Figure 1 is a view in side elevation of the device attached to the edge of a table or desk, with a portion shown in cross section; and Figure 2 is a top plan view of the device.

As shown herein, the device is designed for attachment to the edge of a table or desk and to be operated by a crank located outwardly beyond the edge and rotative about a horizontal axis. In common therefore with devices intended for table attachment, the machine has a cast metal frame consisting of a main portion 1 adapted to rest upon the top of the table and form the base for the moving parts, a V-shaped yoke 2 extending downwardly from the outer edge of the main frame portion and thence curving inwardly to extend beneath the top, and finally a clamping screw 3 mounted at the lower end of the yoke.

The main portion of the frame 1 consists generally of a longitudinal web 1 having transverse webs 4, 5 at each end which form the feet which rest upon the table surface. The frame also supports a horizontal feed plate 9 for the work to be crimped, the same being elongated in the direction of the edge of the table and to which the device is attached with the plate elevated an inch or so above its surface. Just above and below the plate are two crimping wheels 5 and 6 which mesh with each other through a slot 4 formed near one of the longitudinal edges of the plate and substantially in the plane of the surface of the plate.

The longitudinal web 1 of the frame has an upstanding flange 7 which one of the longitudinal edges of the feed plate abuts, said flange being spaced a short distance outwardly from the plane of the two crimping wheels, and along its top edge the flange has a lip projecting toward the plane of the wheels, thereby forming a laterally facing channel 7b for guiding the edges of the sheets of paper as they are fed along the plate 4 and between the crimping wheels.

Extending outwardly from the frame and in prolongation of the axis of the lower crimping wheel 6 is a cylindrical journal bearing 8 for a shaft 9, on the inner end of which is mounted said lower crimping wheel. At the outer end of this shaft is a crank 10 which is turned by hand for driving the lower crimping wheel.

The crimping wheels have narrow and somewhat rounded peripheries in the edges of which are cut small fine teeth which resemble milling rather than gear teeth, although they are accurately cut so that they mesh perfectly with each other and are sufficiently sharp so that two or more sheets of paper are crimped together when passed between the wheels.

Bearing members 11 and 12 integral with the frame 1 support the upper and driven crimping wheel 5. The bearing member 11 consists of a vertical hollow cylindrical journal box forming an integral extension of the journal bearing 8 of the lower crimping wheel shaft and projecting a short distance above the upper crimping wheel and at right angles to its axis. The other bearing member 12 has the form of a horizontal hollow sleeve spaced from the base of the bearing member 11 and made integral therewith by the provision of a pair of U-shaped yokes 13 enclosing a space in which the upper crimping wheel is located. The bearing member 12 is in reality an out board bearing for one end of a spindel 14 on which the crimping wheel 5 is journaled, the opposite end of said spindel extending through a slot 11 in the wall of the journal box 11 near its base and thence into the lower end of the hollow space therein.

The spindel 14 is of a substantial diameter such that it is incapable of any appreciable displacement from its true axis under pressure applied radially against the crimping wheel during the crimping operation, although a certain bodily adjustment of the spindel and the upper crimping wheel is permitted by a spring tension device located in the upright bearing member 11 and 12.
acting on the adjacent end of the spindle. This tension device comprises a shoe 15 having a half round portion 15* bearing downwardly upon the end of the spindle housed within the lower end of the bearing member. Above the shoe is a heavy coil spring 16 occupying the remaining portion of the hollow bearing member 11 and bearing at its lower end against the shoe and at its upper end against a threaded cap 17 inserted into the upper end of the bearing member.

The outer end of the spindle 15 is supported in a bushing 18 which screws into the outer end of the bearing member 12, and having a socket portion 18* into which the end of the spindle fits.

The adjustment permitted by this arrangement is a slight upward lifting of the spring-resisted end of the spindle in order to accommodate different thicknesses of paper or a greater or lesser number of sheets passed between the crimping wheels, so that the crimping pressure is substantially uniformed under all conditions of operation, with a consequent uniformity of result. Moreover, the spring adjustment is entirely automatic and eliminates the uncertainty of manual adjustment, both as to performance and breaking of parts, as is more likely to occur in the type of device disclosed in the foregoing mentioned disclosure.

The operation of the device is the same as in the previous disclosure, namely, the sheets of paper to be fastened together are arranged so that the edges to be cramped coincide with each other, and then feeding the sheets toward the wheels with one hand the crank is turned with the other. In this operation the feed plate 4 supports the sheets in flatwise position and the groove or channel 7* along the edge of the feed plate guides the edges of the sheets in a straight path and at a uniform distance of approximately $\frac{1}{4}$ inch beyond the crimping wheels so that the line of crimping extends in a straight line across the margins of the overlapping sheets about the same distance inwardly from their coinciding edges.

The crimping is manifestly the result of pressing the fine intermeshing fibers into the fibrous texture of the paper with sufficient force to bring about a close adhesion but without appreciably rupturing the fibers. The crimping is not the equivalent of a permanent fastening, as for instance by stapling, but is more in the nature of a semi-permanent fastening in that the sheets can be separated after they are cramped by ripping or pulling them apart, although it is not always possible to do so without some tearing along the line of crimping.

Having set forth a preferred embodiment of my invention, I claim:

1. A crimping device comprising a frame, a pair of rotative crimping wheels mounted on said frame, means for driving one of said wheels, a spindle on which the other of said wheels is journaled, said frame including supporting members on opposite sides of said last-mentioned wheel and supporting said spindle, one of said members having the form of a tubular journal box into which the adjacent end of said spindle projects, and a spring mounted in said journal box and bearing on the adjacent end of the spindle to yieldingly resist the bodily shifting thereof in a direction to separate the peripherals of said wheels in the passage of the material to be cramped therebetween.

2. A crimping device comprising a frame, a pair of rotative crimping wheels mounted on said frame, means for driving one of said wheels, a non-rotative spindle on which the other of said wheels is journaled, said frame including hollow cylindric supporting members mounted on opposite sides of said last-mentioned wheel and supporting the ends of said spindle, one of said members extending at right angles to the axis of the spindle and having an opening to receive the end thereof, a bearing shoe in said last-mentioned member and bearing on the adjacent end of the spindle, and a spring backing said shoe and acting to yieldingly resist the shifting of said spindle in a direction to separate the peripherals of said wheels in the passage of the material to be cramped therebetween.

3. A crimping device comprising a frame, a driving wheel journaled on said frame, a driven wheel having peripheral crimping teeth adapted to mesh with complementary teeth on said driving wheel, said frame including a pair of supporting members disposed in spaced relation on opposite sides of said driven crimping wheel, said driven wheel supporting at its ends in said members and rotatively supporting said driven wheel intermediate its ends in the space between said supporting members, one of said supporting members having the form of a hollow cylindric journal box at right angles to the axis of said driven wheel and slotted to receive one end thereof, and a spring mounted in said journal box and acting on the adjacent end of said spindle to yieldingly resist its bodily movement under the pressure exerted on the driven wheel in the passage of the material to be cramped between said wheels.

4. A crimping device comprising a frame, a driving wheel journaled on said frame, a driven wheel having peripheral crimping teeth adapted to mesh with complementary teeth on said driving wheel, said frame including a pair of supporting members disposed in spaced relation on opposite sides of said driven crimping wheel, a spindle supported at its ends in said supporting members and rotatively supporting said driven wheel intermediate its ends and in the space between said supporting members, said supporting members having the form of hollow journal boxes, one arranged axially of said spindle, and the other at right angles thereto, said last-mentioned journal box having a slot through which the adjacent end of said spindle projects, a shoe in said journal box bearing on said spindle and a spring backing said shoe and acting to resist the bodily movement of said spindle under the pressure exerted on said driven wheel during the crimping operation.

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