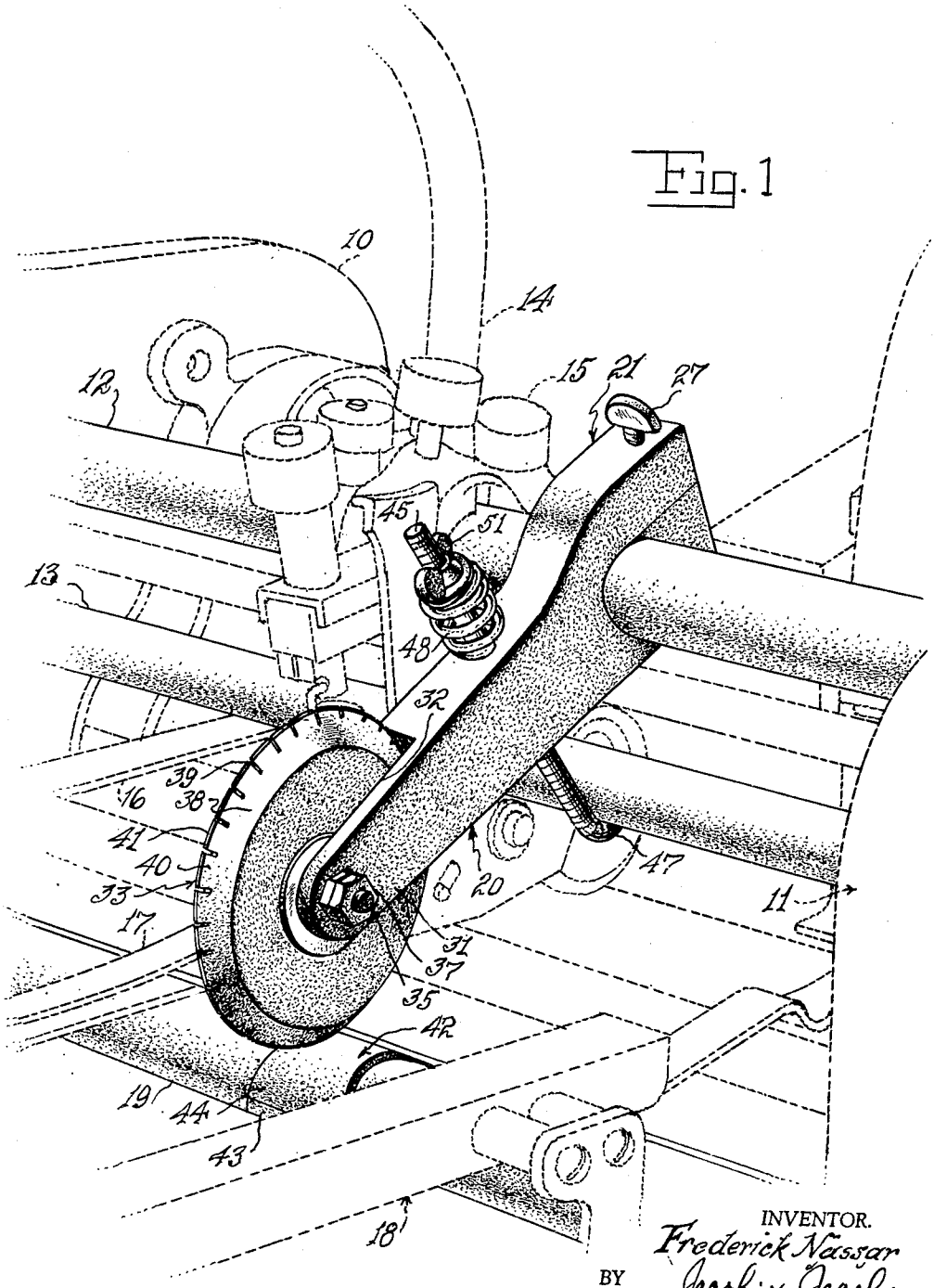
Oct. 13, 1964 F. NASSAR 3,152,501

PAPER PERFORATING ATTACHMENT FOR PRINTING PRESS

Filed Dec. 27, 1960 2 Sheets-Sheet 1

Fig. 1



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PAPER PERFORATING ATTACHMENT FOR PRINTING PRESS

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Fig. 2

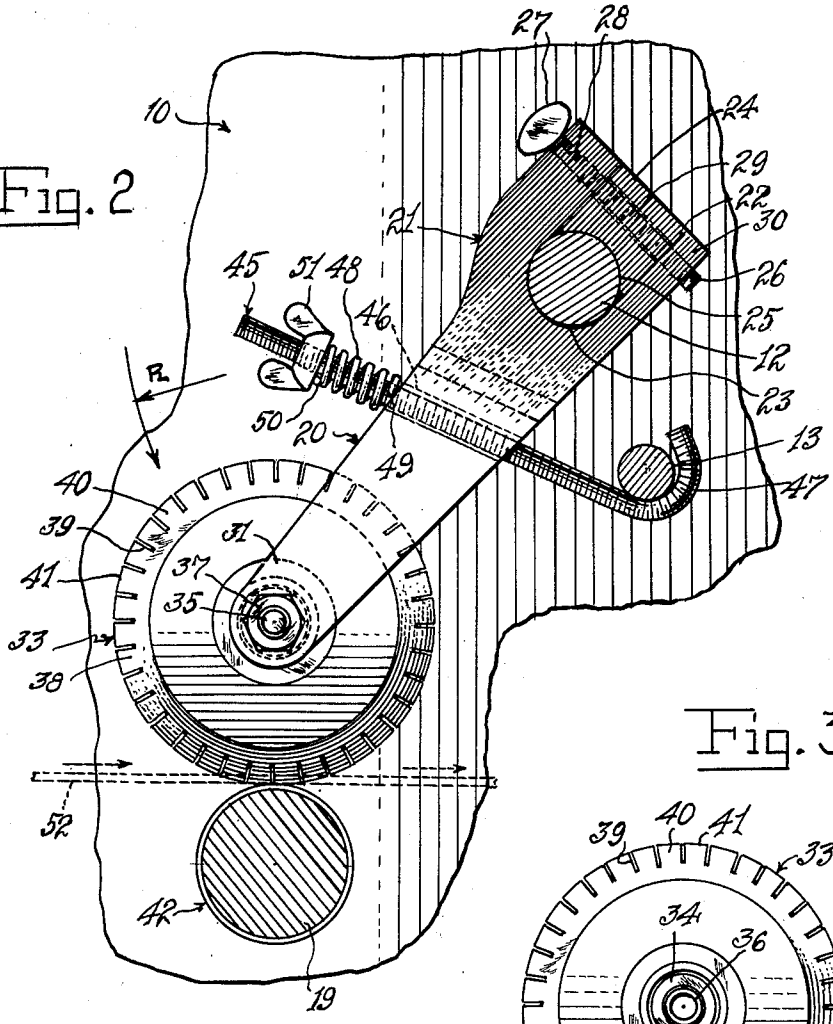
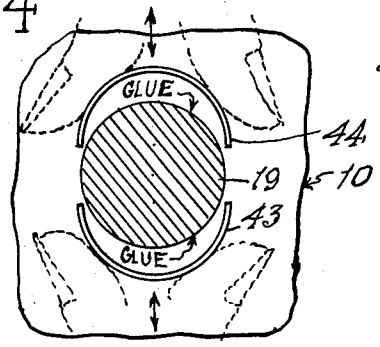


Fig. 3

Fig. 4



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PAPER PERFORATING ATTACHMENT FOR PRINTING PRESS

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2 Claims. (Cl. 83—308)

This invention relates to the treatment of paper and more particularly to a paper perforating attachment for various types of printing presses, mimeograph machines or other machines where paper feeding means is employed and it is desired to perforate the paper being fed to the machine.

It has now become relatively common practice to provide printed business forms in a manner to conveniently permit the making of multiple copies and in order to accomplish this purpose, two or more sheets of paper are super-imposed with sheets of carbon paper inter-leaved therebetween with all of the sheets secured together along one edge to provide a manifolded assembly and it has further been common practice to perforate the sheets of paper along a line inwardly of the edge securing means in such a manner as to permit separation of the sheets to provide individual copies by merely removing the sheets from the secured edge along the perforated line.

Considerable difficulty has been experienced in providing suitable perforating means which could be utilized for rapid and relatively long production runs without necessitating sharpening or renewal of the perforating means and further, in some instances, the perforating means previously utilized has been located subsequent to the printing press with the result that the wet printing was often smeared. Another type of prior art perforating means has been utilized in connection with offset printing presses in which the perforating means comprises a flexible strip of metal having perforating teeth thereon with the strip being secured to the yieldable impression roller commonly termed a blanket, and in many instances this type of operating device has proved unsuitable for other than relatively short production runs and likewise, in some instances this particular perforating device has caused excessive damage to the press blanket requiring replacement of such blanket after each printing operation which is a relatively costly and time consuming procedure.

It is accordingly an object of the invention to provide a paper perforating attachment for printing presses which may be conveniently applied to a printing press or removed therefrom without necessitating any modification whatsoever of such press and without requiring manipulation of any of the press parts.

A further object of the invention is the provision of a paper perforating attachment for printing presses or the like which may be conveniently applied to such presses by utilizing the conventional and normal structural parts of the press for mounting purposes.

A still further object of the invention is the provision of a paper perforating attachment for printing presses which may be applied thereto for perforating purposes and removed therefrom to permit other uses of the press and without in any way damaging or otherwise altering the structure or normal use of the press.

Another object of the inventon is the provision of a paper perforating attachment for printing presses or the like in which a hardened steel perforating wheel is adjustably mounted on the press adjacent the paper feed mechanism, the wheel having perforating teeth on the periphery thereof and in which a two-part sleeve is removably applied to a paper feeding roll to provide a platen for the perforating wheel which prevents damage to the feeding roll and at the same time, permits proper operation of the perforating wheel.

A further object of the invention is the provision of a paper perforating attachment for printing presses or the like, including means for adjusting the perforating attachment to accommodate sheets of paper or cards of varying thickness or to accommodate a varying number of super-imposed sheets of paper.

A still further object of the invention is the provision of a paper perforating attachment for printing presses or the like and including a steel perforating wheel having perforating teeth on the periphery thereof and in which the wheel may be conveniently removed for sharpening or for replacement by another wheel having different perforating characteristics.

A still further object of the invention is the provision of a paper perforating attachment for printing presses or the like, which may be conveniently attached to such press and adjusted to provide a line of perforations at any desired location in paper being fed to the printing press.

Another object of the invention is the provision of a paper perforating attachment for printing presses or the like, which may be conveniently and economically manufactured from readily available materials in such a manner as to provide exceptionally long life and which may be utilized without sharpening or attention for long production runs or a succession of such production runs.

Further objects and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawings wherein:

FIG. 1 is a fragmentary view in perspective showing a portion of the feed mechanism and related structure of a printing press, together with the paper perforating attachment of this invention applied thereto in operative position;

FIG. 2 a fragmentary transverse sectional view showing the paper perforating attachment of this invention mounted on the feed mechanism of the printing press and further showing the manner in which the perforating attachment operates to perforate a sheet or sheets of paper being conveyed by the feeding mechanism to the printing press;

FIG. 3 a side elevational view with parts broken away and in section for greater clarity and showing the structure of the perforating wheel utilized in the attachment of this invention; and

FIG. 4 a fragmentary transverse sectional view showing the manner in which the semi-circular steel shells may be applied to the feed roll of the printing press to provide a sleeve thereon serving as a platen for the perforating wheel; and

With continued reference ot the drawings, there is shown in FIG. 1, the feeding portion of one type of printing press and which may well include opposed side frame members **10** and **11** connected by vertically and horizontally spaced crossbars **12** and **13**. The paper feeding mechanism also includes a vacuum conduit **14** and suitable adjusting mechanism **15**, but such mechanism is not described in detail, since the same is included only to provide an environment for the paper perforating attachment of this invention and obviously, such attachment may be utilized with printing presses or similar apparatus having other specific paper feed mechanisms. The feed mechanism also includes conventional feeding belts **16** and **17** as well as a guide rail **18** and a feed roll **19**. The mechanism briefly described above serves to feed sheets of paper to a printing press or similar apparatus and such feeding mechanism is located on the inlet side of the press, the paper being fed thereby prior to operation of the press for printing thereon.

With particular reference to FIGS. 1 and 2, the paper perforating attachment of this invention may well comprise an elongated arm **20** which may be generally recangular in cross section and may be conveniently passed or

otherwise formed from a relatively light metal, such as aluminum, although if desired, the same may, of course, be made of steel or other suitable material. The arm **20** is provided at one end with an enlargement **21** and provided in the enlargement **21** is a slot **22** which is substantially deeper than the diameter of the upper crossbar **12**, but which is of a width substantially equal to the diameter of such crossbar. The slot **22** terminates at the inner end in an arcuate surface **23** having a radius equal to the radius of the upper crossbar **12** and a filler block **24** is provided for the outer end of the slot **22** with the filler block **24** being provided with an inner arcuate surface **25** having a radius equal to the radius of the upper crossbar **12**. A screw threaded member **26** having a finger engaging knob **27** extends through an aperture **28** in the enlarged end **21** of the arm **20** and through an aperture **29** in the filler block **24** to be threadedly received in an aperture **30** in the enlarged end **21** of the arm **20** to securely hold the filler block **24** in position and thereby pivotally mount the arm **20** on the upper crossbar **12**. It will be noted that this structure serves to pivotally mount the arm **20** for vertical swinging movement and that the arm **20** may be conveniently removed or replaced simply by removing or replacing the filler block **24**. Since the inner arcuate surface **23** of the slot **22** and the inner arcuate surface **25** of the filler block **24** are provided with the same radius as the upper crossbar **12**, the arm **20** is firmly and pivotally attached thereto by this structure.

The opposite end **31** of the arm **20** is provided with a slot **32** disposed at right angles to the slot **22** in the opposite end of the arm **20** and rotatably mounted on the arm **20** within the slot **32** is a hardened steel perforating wheel **33** which, as shown in FIG. 3, is provided with an anti-friction bearing **34** for receiving an axle **35** extending through an aperture **36** in the bearing **34** and through apertures in the arm **20** adjacent the outer end of the slot **32**. The axle **35** may be secured in place by screw threaded fastening means or the like **37** and such fastening means, as well as the axle **35** may be conveniently removed to permit removal of the wheel **33** for sharpening or replacement by another wheel having different characteristics. As shown in FIGS. 1 and 3, the perforating wheel **33** is provided with a beveled outer surface **38** and with a series of equally spaced radial slots **39** in the periphery thereof which serve to provide a plurality of spaced perforating teeth **40** on the periphery of the wheel **33**. The teeth **40** are provided with a relatively sharp cutting edge **41** which operates in a manner to be presently described.

As will be clear from an inspection of FIGS. 1 and 2, the perforating wheel **33** is disposed directly above the feed roll **19** and in order to protect the surface of the feed roll **19** from damage by the wheel **33** and also in order to provide a platen or backing means for the wheel **33**, a hardened steel sleeve **42** is applied to the feed roll **19** and as best shown in FIG. 4, such sleeve **42** may take the form of a pair of hardened steel semi-circular shells **43** and **44** which may be applied to the surface of the feed roll **19** and secured thereon by glue or some other suitable adhesive or if desired, other fastening means for securing the shells **43** and **44** in place on the feed roll **19** may be employed. As shown in FIGS. 1 and 2, the sleeve **42** is disposed opposite the perforating wheel **33** and engages the cutting edges **41** of the perforating teeth **40** during operation of the attachment.

Since it is necessary to urge the perforating wheel **33** against the sleeve **42** with some pressure during perforating operations and further, since it is necessary to adjust such pressure depending upon the thickness of paper or cards or the numbers of layers of paper being perforated suitable adjusting means is provided and as best shown in FIGS. 1 and 2, this adjusting means may take the form of an elongated threaded rod **45** slidably received in an aperture **46** in the arm **20** in the plane

of the wheel **33** with an end **47** of the rod **45** being formed as a hook to engage under the lower crossbar **13** of the printing press. A compression spring **48** is slidably received on the rod **45** with one end **49** of the spring **48** engaging the upper surface of the arm **20** and with the opposite end **50** of the spring **48** engaging a wing nut **51** threadedly received on the rod **45**. Obviously, adjustment of the wing nut **51** will serve to adjust the compression of the spring **48** thereby adjusting the force with which the perforating wheel **33** engages the sleeve **42** on the feed roll **19**. When removing the perforating attachment of this invention from the printing press it is only necessary to loosen the wing nut **51** sufficiently to permit disengagement of the hook-shaped end **47** from the lower crossbar **13** and thereafter upon removal of the filter block **24**, the entire perforating attachment may be removed from the press.

In operation and with the attachment of this invention applied to the press in the manner above described, the paper to be perforated which may comprise a single sheet of any desired thickness or a plurality of superimposed sheets of paper are fed to the perforating attachment as shown by dotted lines **52** in FIG. 2 and it is, of course, understood that the wing nut **51** has been adjusted to provide the proper degree of pressure between the perforating wheel **33** and the sleeve **42** on the feed roll **19**. As the paper **52** passes between the perforating wheel **33** and the sleeve **42**, the perforating teeth **40** will pass through the paper **52** and into engagement with the sleeve **42** to perforate the paper with the portions of the paper falling in the slots **39** remaining intact. It has been found that this perforating attachment may be operated at a relatively high rate of feeding speed and furthermore, the attachment will operate for extremely long production runs or a succession of such runs without becoming dull or in any way impairing the perforating operation. Since the perforating operation is performed prior to the printing operation, no smearing or other damage to the printed copy may result and furthermore, since the perforating attachment of this invention is entirely independent of the printing mechanism, the attachment may be so positioned as to locate a line of perforations at any desired distance from the edge of the paper to be perforated.

The convenience of attaching or removing the perforating attachment from the printing press is of particular significance as is also the fact that any damage to the press or parts thereof is prevented by the use of the steel sleeve **42** on the feed roll **19** and furthermore, no modification of the press or feed structure is necessary and no manipulation of the parts thereof is required for installation or removal of the perforating attachment of this invention.

It will be obvious to those skilled in the art that various changes may be made in the invention without departing from the spirit and scope thereof and therefore the invention is not limited by that which is shown in the drawing and described in the specification, but only as indicated in the appended claims.

What is claimed is:

1. A paper perforating attachment for a printing press having opposed side frame members, vertically and horizontally spaced crossbars connecting said frame members and a paper feeding mechanism including a feed roll disposed in a plane below the lowermost crossbar, said attachment comprising an elongated arm generally rectangular in cross section and inclined downwardly toward said roll, one end of said arm having a slot for receiving the upper crossbar, said slot being substantially deeper than the diameter of said upper crossbar and terminating at the inner end in an arcuate surface having the same radius as said upper crossbar, a filler block for the outer end of said slot, an inner arcuate surface on said block for engaging said upper crossbar and having the same radius as said upper crossbar, a threaded screw having

a wing nut at the top thereof for releasably securing said block in said slot to pivotally mount said arm on said upper crossbar for free pivotal movement toward and away from the feed roll, the opposite end of said arm having a slot disposed at right angles to said first mentioned slot, a hardened steel perforating wheel received in said last mentioned slot and rotatably mounted on said arm, perforating teeth on the periphery of said wheel, said perforating wheel having opposite planar bearing surfaces projecting outwardly from the sides thereof and each side of said wheel having a beveled periphery terminating at an outer portion having said perforating teeth thereon, a pair of hardened steel semi-circular shells for application to said roll to provide a sleeve thereon in alignment with said wheel, said sleeve serving as a platen for said wheel, said arm having an aperture in the plane of said wheel, said aperture being inclined in a substantially perpendicular direction to the inclination of said arm, a circular threaded rod slidably received in said aperture, a semi-circular hook on one end of said rod engaging the lower crossbar, a compression spring on the opposite end of said circular rod engaging said arm and a wing nut threaded on said rod engaging said spring to adjust the pressure between said wheel and said sleeve.

2. A paper perforating attachment for a printing press having opposed side frame members, vertically and horizontally spaced crossbars connecting said frame members and a paper feeding mechanism including a feed roll disposed in a plane below the lowermost crossbar, said attachment comprising an elongated arm downwardly inclined toward said roll, one end of said arm having a slot for receiving the upper crossbar, said slot being substantially deeper than the diameter of said upper crossbar and terminating at the inner end in an arcuate

surface having the same radius as said upper crossbar, a filler block for the outer end of said slot, an inner arcuate surface on said block for engaging said upper crossbar and having the same radius as said upper crossbar, means for releasably securing said block in said slot to pivotally mount said arm on said upper crossbar for free pivotal movement toward and away from the feed roll, a perforating wheel rotatably mounted on said arm at the opposite end from said slot, perforating teeth on the periphery of said wheel, a pair of semi-circular shells for application to said roll to provide a sleeve thereon in alignment with said wheel, said sleeve serving as a platen for said wheel, said arm having an inclined aperture in the plane of said wheel, the incline of said aperture being positioned in a substantially perpendicular direction to the inclination of said arm, a threaded rod slidably received in said aperture, a hook on one end of said rod engaging the lower crossbar, a compression spring on the opposite end of said rod engaging said arm and a wing nut on said rod engaging said spring to adjust the pressure between said wheel and said sleeve, whereby said arm can pivotally slide in a vertical direction upon the inclined threaded rod.

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