To all whom it may concern:

Be it known that we, WILLIAM H. SCHUYLER and GEORGE J. CHILES, of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Means for Polishing Space Bands, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to means for polishing space bands.

In the operation of linotype machines it is necessary to frequently polish the casting faces of the space bands. If this precaution is neglected and that portion of the casting face of the space band which comes in contact with the metal is not clean, a small portion of the metal will adhere to the space band at this point and with repeated use of this band this deposit will increase in size. When space bands with such deposits are used the matrices adjacent to these space bands will be crushed inwardly by the metal deposits on the space bands and ruined, and furthermore slight spaces are formed between the space bands and the adjacent matrices, which receive the metal and form a sharp fin. These fins in printing cause polishing of the space bands. It is necessary after the space bands have been polished to assemble them with their casting faces all facing the same direction and in order that they may be properly reinserted into the linotype machine. This operation has also heretofore been manually accomplished.

The objects of our invention are:

First, to provide means for mechanically and automatically polishing space bands.

Second, to provide a mechanical means for polishing space bands in combination with means for receiving the space bands from the polishing means and assembling them with their casting faces in the same direction.

Third, to provide a machine of the type described which will thoroughly and uniformly polish the space bands at a high rate of speed.

Fourth, to provide a machine of this character which is comparatively simple and economical to manufacture.

Other objects will appear as the description progresses, reference being had to the accompanying drawings in which:

Figure 1 is a side elevation of our improved mechanism for polishing space bands, certain portions thereof being broken away.

Fig. 2 is a plan view thereof with certain portions broken away.

Fig. 3 is a sectional detail view taken on the line 2—2 of Fig. 2, and

Fig. 4 is a sectional detail view taken on the line 4—4 of Fig. 2.

Fig. 5 is a perspective view of part of the mechanism for successively feeding the space bands onto the polishing disk, portions of the apparatus being broken away.

In the drawings similar reference characters refer to the same parts.

Referring to the drawings the reference character 5 indicates a bed plate which is supported by suitable legs 6. Rotatably mounted in bearings 7 secured to the bed plate is a shaft 8 which is driven through a worm gear 9 secured to lower end thereof and meshing with a worm 10 secured to the shaft 11 of an electric motor 12. The motor 12 is suitably supported from the bed plate 5. Secured to the upper end of the shaft 8 is a disk 13 to which is secured a polishing disk 14 by means of screws 14'. This polishing disk is preferably formed from a piece of wood with the fibers running in a vertical direction. We have found that a piece of pine wood is very suitable for this purpose.

The means for successively feeding the space bands to the polishing disk comprise a feed chute formed by upwardly extending guide ways 15 and 15' of the longitudinal bracket 16 and a longitudinally extending guide bar 17 respectively. The bracket 16 is secured to a base member 18 by means
of screws 19 and the guide bar 17 is supported from the base member 18 by the bracket 20. The bracket 20 is secured to the base member by screws 21. The base member 18 is secured to the bed plate 5 by screws 18. The outer edges of the members 15 and 17 are cut away to provide ways 22 for receiving the ears of the space bands.

In the operation of the machine a set of the space bands is first hung upon the horizontal portions 23 of the feed chute and is then moved to the right in Fig. 1 and turned through an angle of 90 degrees until the set of space bands occupies a horizontal position with the lower band resting upon the bar 24, (see Figs. 2 and 4) which together with the bracket 16 and a guide bar 17 form a guideway for the space bands.

The means for successively feeding the space bands from the feed chute to the polishing disk comprises a guide bar 25 which reciprocates between the bracket 20 and the guide bar 17. The feed bar 25 is supported intermediate its ends by the cross bar 28, which is secured to the end of the bar 24 by means of screws not shown. Extending upwardly from the lower end of the feed bar 25 is an elongated thin sheet metal lug 27, the outer end 28 of which engages behind the ears at one side of the space bands when the feed bar is in its innermost position, and which when the feed bar moves to its outer position causes the space bands to be carried out of the feed chute and on to the polishing disk. A cover plate 29 is secured to the outer edges of the members forming the feed chute by means of a bracket 30 and screws 31. The central portion of the lower edge of this cover plate is cut away as indicated at 32 in Fig. 5 to permit the wedges of the space bands to pass beneath the lower edge of the cover plate. The side portions 33 of the lower edge of the cover plate are however spaced from the cross bar 26 just sufficiently to allow the ears of a single space band to pass therebetween, these portions 33 acting as stops to prevent the upper space bands in the feed chute from passing on to the polishing disk. The lug 27 is of such length that its inner end is positioned beneath the stack of space bands when the feed bar is in its innermost position. When the feed bar returns to its innermost position the lowest space band in the bunch drops down in front of the lug 27 in position to be carried on to the disk at the next outward movement of the lug 27. In operation the polishing disk 14 revolves in the direction of the arrows in Figs. 2 and 5 and a guide bar 34 is secured to the bracket 16 and extends outwardly to prevent the space band from being carried in the direction of movement of the polishing disk.

Fig. 5 illustrates substantially the outermost position to which the lug 29 is actuated during the operation of the machine. In order to convey the space band across the polishing disk we provide a plunger 70 housing 35 which is secured to the outer end of the feed bar 25 by means of screws 26. A plunger 37 having a friction block 38 secured to its lower end reciprocates in the housing 35 and is urged downwardly by a spring 39, one end of which abuts against the upper end of the housing and the other end of which abuts a shoulder 40 formed on a lower end of the plunger. The upper end of the plunger is bifurcated to receive the releasing key 41 which reciprocates in a slot 42 in the upper end of the casing 35. An anti-friction roller 43 is mounted between the bifurcations of the upper end of the plunger and rides upon the upper edge of the releasing key 41. It will be noted from inspection of Fig. 1 that the outer end of the releasing key 41 is higher than the inner end and joined by a cam surface 44. A bracket 45 is secured to the bed plate 5 and provided with a set screw 46 which acts as an adjustable abutment for the outer end of the releasing key 41. Referring to Fig. 1 it will be seen that a continued outward movement of the feed bar will cause the roller 43 to move upwardly on to the higher outer portion of the key 41, whereby the space band beneath the friction block 38 will be released, the key 41 being held from any further outer movement by the set screw 46. When the feed bar moves to its inner position the inner end of the key 41 engages the cover plate 29 before the feed bar reaches the inner end of its stroke and the roller 43 will therefore roll down the inclined portion 44 of the key and cause the friction block 38 to rest upon the space band, under the tension of the spring 39, which has previously been positioned above the friction disk by the lug 27. When the feed bar again moves outwardly the space band will be carried across the upper face of the polishing disk until the feed bar reaches its outermost position when this space band will be released by the upward movement of the plunger, as explained above. The feed bar 25 is reciprocated by means of a pitman 47, one end of which is pivotally secured to a downwardly projecting lug 48 of the feed bar (see Fig. 4), which reciprocates in a longitudinal slot 49 formed in the base member 18. The other end of the abutment is pivotally secured adjacent the edge of the gear 50, the shaft 51 of which rotates in a bearing 52 formed in the bed plate. This gear is driven from the shaft 8 by means of the reduction gear train which comprises the pinion 53 secured to the shaft 8, and the gear 54 and pinion 55 which are secured together and rotate about the stud shaft 56.
The pinion 55 meshes with the gear 50. The gear ratio between the shaft 8 and the gear 50 is such that the polishing disk makes approximately eight revolutions to each reciprocation of the feed bar 25. The space band travels over that portion of the polishing disk, which is approximately four inches in diameter. The face of each polishing band is subjected to the action of approximately eight feet of polishing surface. It will be understood of course that the gear ratio between the shaft 8 and the gear 50 may be anything desired, and that the size of the polishing disk may be varied as found desirable.

In the operation of the machine thus far described a set of space bands are placed in the feed chute in a horizontal position with their casting faces down. The motor 12 is then connected with a suitable source of current. The lug 27 successively positions the space bands at one edge of the polishing disk where they are successively engaged by the friction block 38 and conveyed across the friction disk and released at the opposite side thereof by the action of the releasing key 41. We provide a spring pressed plunger 57 which is secured to cover plate, 30 and the lower end of which rests upon the space bands after they have been delivered to the friction disk to prevent them from being carried outwardly before they are engaged by the friction block 38.

We have provided means for receiving the bands as they are discharged from the polishing disk due to the rotary motion thereof and assembling them with their casting faces in the same direction. This means comprises a bracket 58 which is removable secured to the bed plate 5 by means of screws 59 and on the outer end of which is pivotally mounted an assembling arm 60 which can be rotated in a horizontal plane about a pivot screw 61. The end of the arm 60 which is engaged by the screw 61 is provided with a flattened edge 62 which is engaged by a spring 63 secured to the bracket 58 for yieldingly holding the arm 60 in position to receive the space bands from the polishing disk. The bracket 58 is also provided with a guide bar 64, which extends over and almost in contact with the upper face of the polishing disk, as shown in Fig. 2. When the space bands are released by the action of the key 41, the motion of the polishing disk carries them against the guide bar 64 and the friction between the polishing disk and the wedge of the space band causes the space band to move outwardly along the guide bar 64 until the opening 65 (see Fig. 2) in the wedge of the space band (see Fig. 2) is positioned above the inner end of the upwardly curving assembling arm 60. The outer end of the space band then travels along above the arm 60 until the rear end of the wedge clears the disk, when it drops downwardly and the space band drops to the position shown in the dotted outline in Fig. 1. The arm 60 is long enough to receive an entire set of space bands. When it is desired to remove the space bands from the arm 60 the inner end of this arm is moved away from the bracket 58 in order to permit the space bands to be easily removed therefrom.

We have found that the polishing action of the wooden disk is increased by supplying powdered graphite to the polishing face thereof and for this we have provided a hopper 66, which has a narrow slot 67 in the bottom thereof through which the graphite is discharged. The slot 67 is surrounded on all sides by a strip of felt 68 which prevents an excess amount of graphite from being fed to the disk. The hopper 66 is supported by a bracket 69 which is secured to the bracket 20 by screws 70.

While we have described the polishing disk as preferably formed of wood, it is to be understood that this disk may be formed of leather, fiber, or any other material which is capable of polishing the faces of the space bands.

While we have described the details of the preferred embodiment of our invention it is to be understood that our invention is not limited except by the scope of the following claims.

Having described our invention what we claim is:

1. The combination with a rotatably mounted polishing disk of a feed chute for receiving and holding space bands in a vertical stack adjacent the edge of said disk, a feed bar mounted to reciprocate above said disk, a lug secured to said bar intermediate the ends thereof for engaging the lowermost band and carrying it on to said disk, a plunger mounted to reciprocate on the outer end of said bar at right angles to the outer end of said disk and provided with a friction block for engaging the upper sides of said space bands, a spring for urging said plunger downward, means for raising and locking said plunger at the outer end of its stroke, means for releasing said plunger at the inner end of its stroke, an assembling arm having its free end spaced from and below the upper face of said disk, a guide bar extending above said disk for guiding the space bands above said assembling arm, and means for rotating said disk and reciprocating said feed bar.

2. The combination with a rotatably mounted polishing disk of a feed chute for receiving and holding a stack of space bands with the lowest one in a plane slightly above the plane of the upper face of said polishing disk, means for successively conveying the space bands from the bottom of said stack to a position above said disk and at one edge thereof, means for moving said space bands...
across said disk and in frictional contact therewith, means for releasing said last named means from said space bands to allow the space bands to be discharged from said disk, an assembling arm, and means for guiding said bands from said disk on to said assembling arm.

3. The combination with a rotatably mounted polishing disk of means for holding a stack of space bands adjacent the upper face or said disk, means for successively moving the bands of said stack on to the upper face of said polishing disk adjacent one edge thereof, means for successively moving the bands across the said disk, means for releasing said last named means from said bands to permit them to be discharged from said disk, and means for receiving said bands from said disk and holding them with their casting faces turned in the same direction.

4. The combination with a rotatably mounted polishing disk, of means for holding a stack of space bands adjacent the upper face of said disk, means for successively moving the bands of said stack on to the upper face of said polishing disk adjacent one edge thereof, means for successively moving the bands across the said disk and means for releasing said last named means from said bands to permit them to be discharged from said disk.

5. The combination with a rotatably mounted polishing disk of means for successively feeding a plurality of space bands across said disk, means for successively moving the bands across said disk in frictional contact therewith, and means for receiving the bands from said disk and assembling them with their casting faces in the same direction.

6. The combination with a rotatably mounted polishing disk of means for moving space bands across said disk, and means for receiving the bands from said disk and holding them with their casting faces in the same direction.

7. The combination with a polishing disk of means for moving space bands across the face thereof from one point adjacent the periphery to another point adjacent the periphery thereof, and means for receiving the space bands from said disk and holding them with their casting faces in the same direction.

8. The combination with a rigid fibrous polishing disk, of means for supplying graphite to the surface thereof, means for moving space bands across said polishing disk with their casting faces in contact therewith, and means for receiving the space bands and assembling them with their casting faces turned in the same direction, comprising a pivotally mounted member.

9. The combination with a polishing disk, of means for conveying space bands across said polishing disk with their casting faces in contact therewith, means for releasing said space bands, and means for catching said space bands as they are discharged from said polishing disk by centrifugal force and assembling them with their casting faces turned in the same direction.

10. In a device of the class described, the combination with a horizontal, rotatably mounted polishing disk, of a substantially vertical chute adjacent thereto, arranged to receive a stack of space bands, means at the base of said chute for successively moving the lowest band from said stack onto the upper face of said disk adjacent the edge thereof, means for successively moving the bands across the said disk, and means for releasing said last mentioned means to discharge the space bands.

In witness whereof, we hereunto subscribe our names this 25th day of March, 1918.

WILLIAM H. SCHUYLER.
GEORGE J. CHILES.

Witnesses:

EARL F. PIERCE,
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