May 21, 1963 C. E. GOSSEN 3,090,057

SPACEBAND CLEANER

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Fig. 1

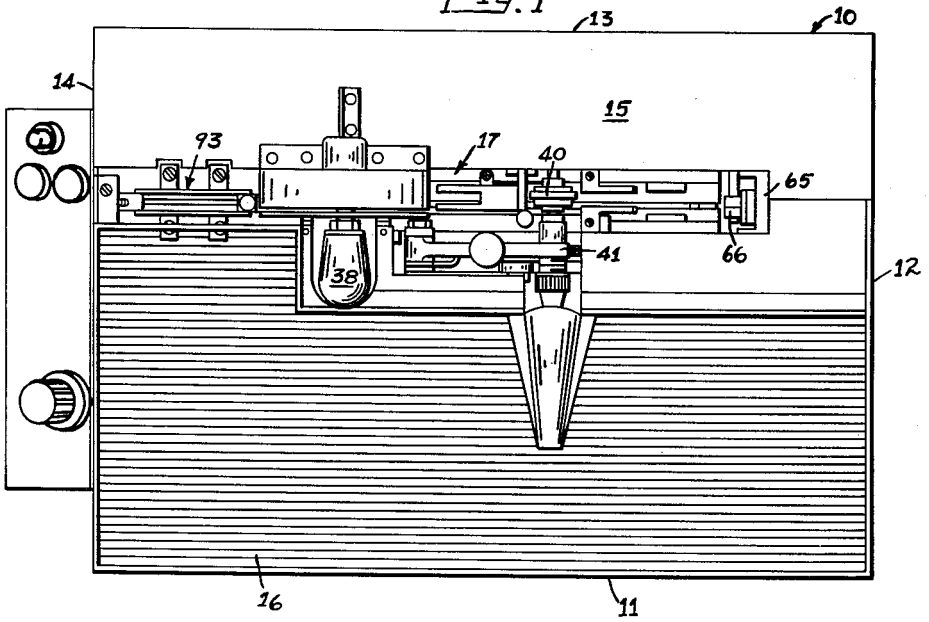
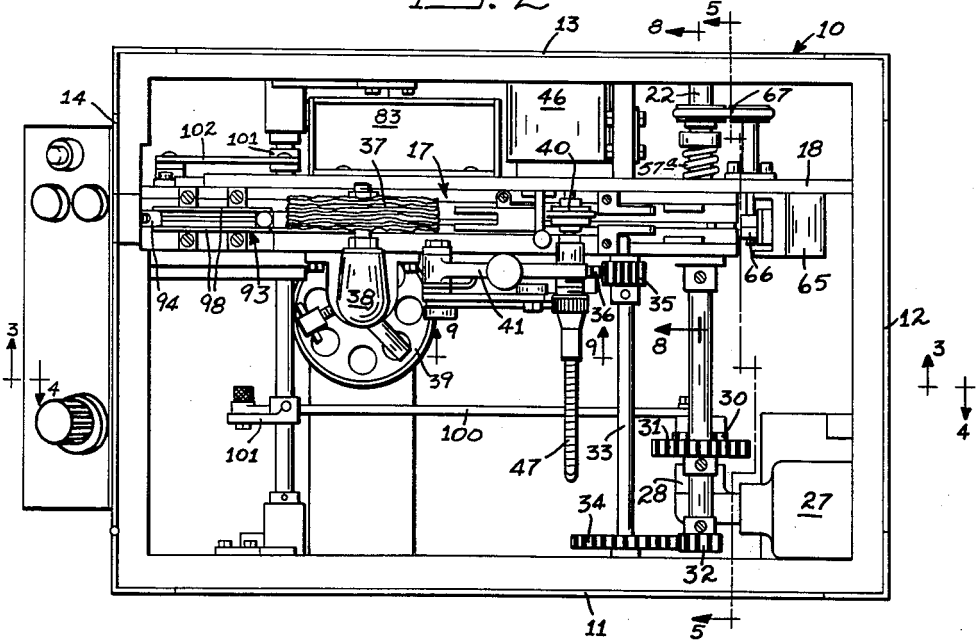


Fig. 2



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SPACEBAND CLEANER

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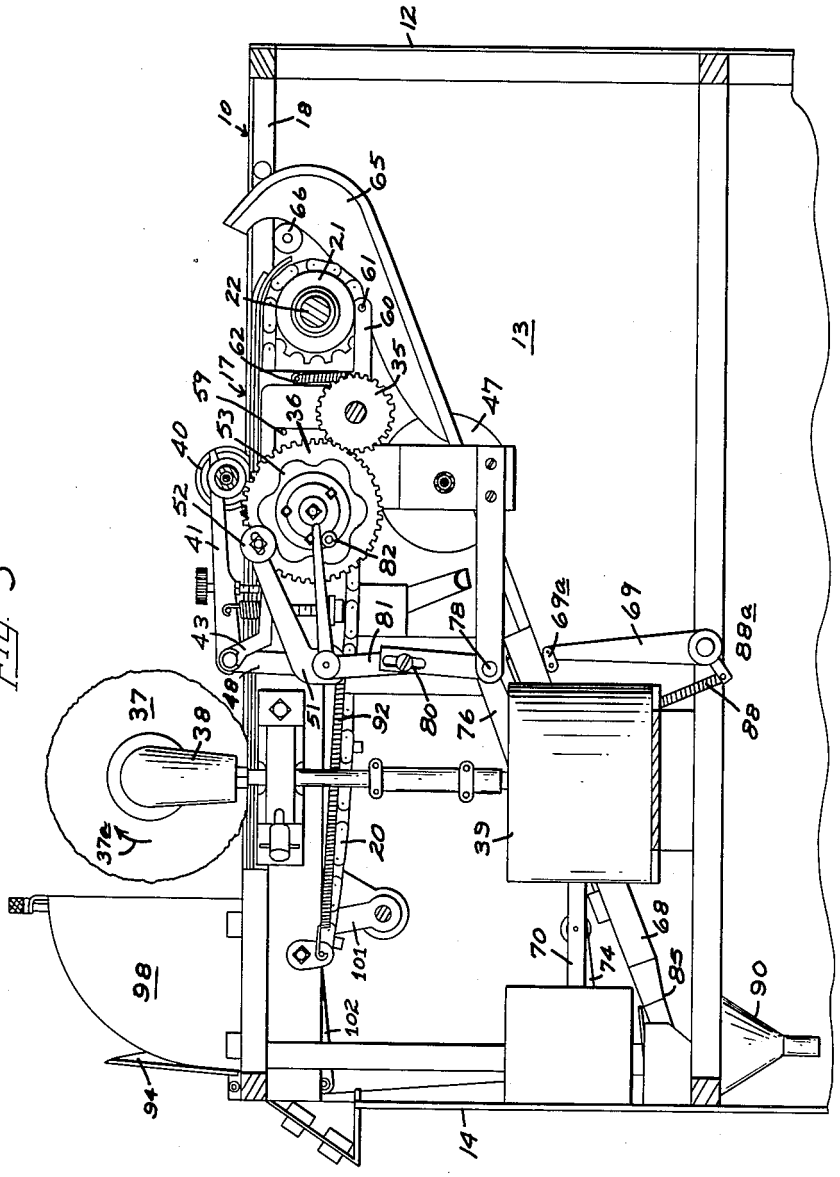

Fig. 3

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Fig. 4

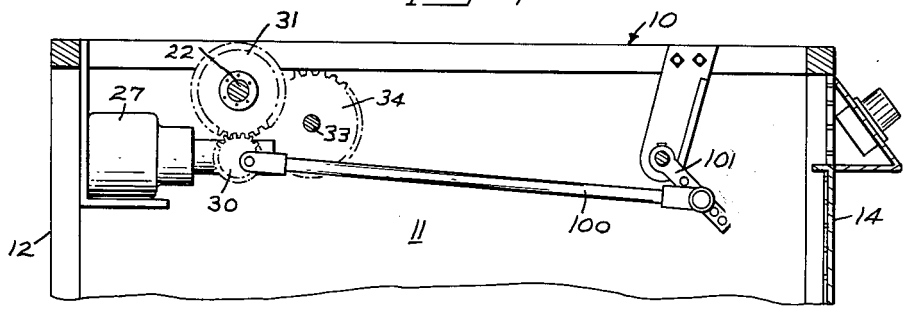


Fig. 5

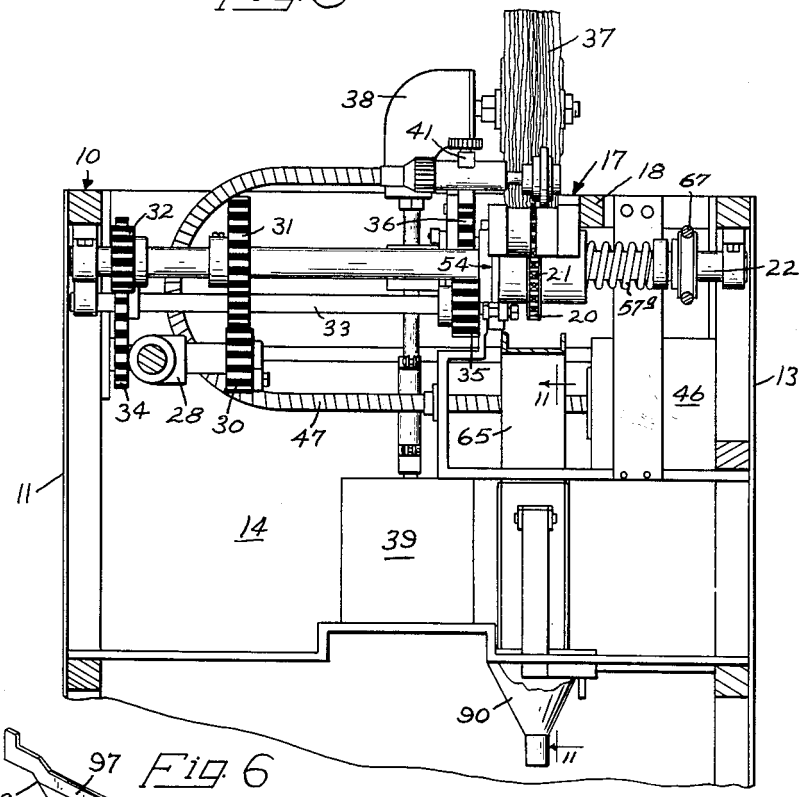
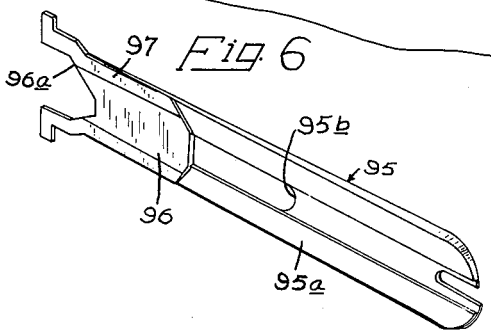


Fig. 6



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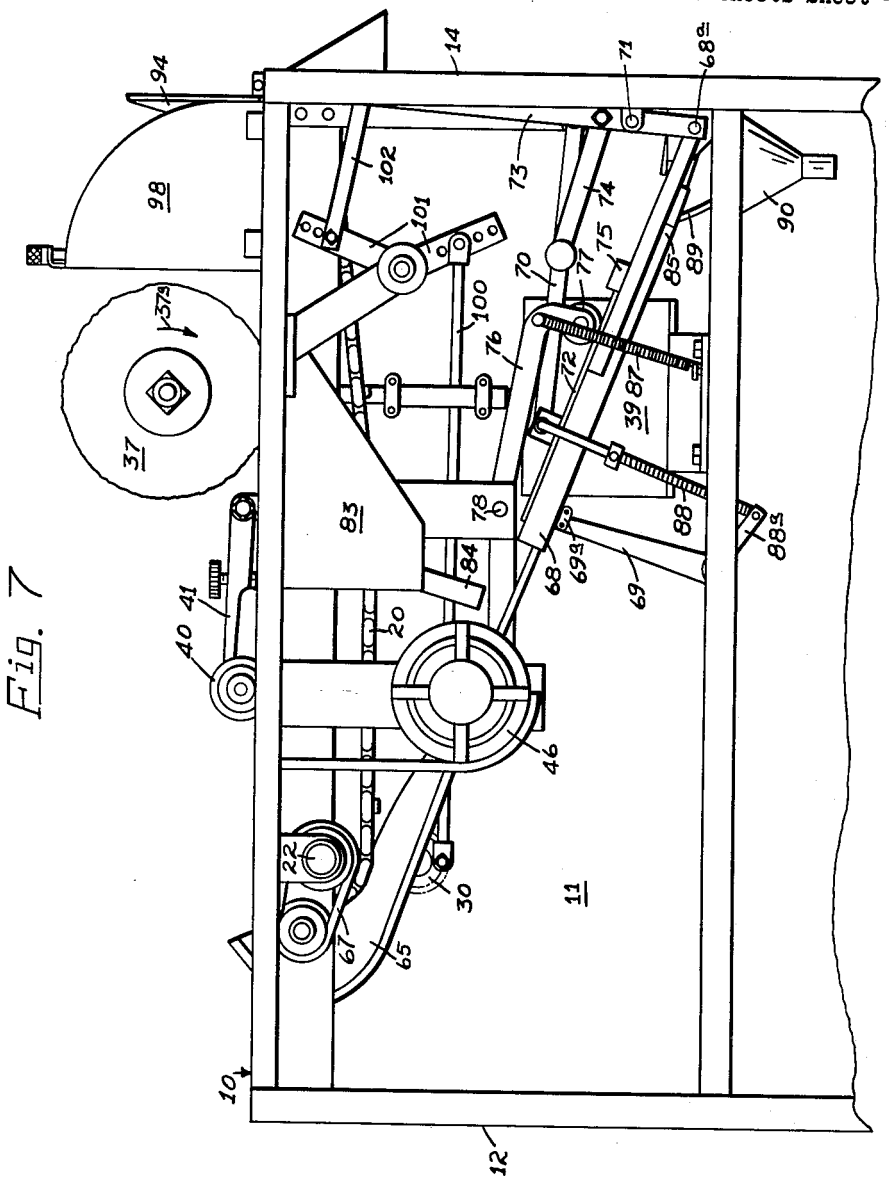

Fig. 7

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Fig. 8

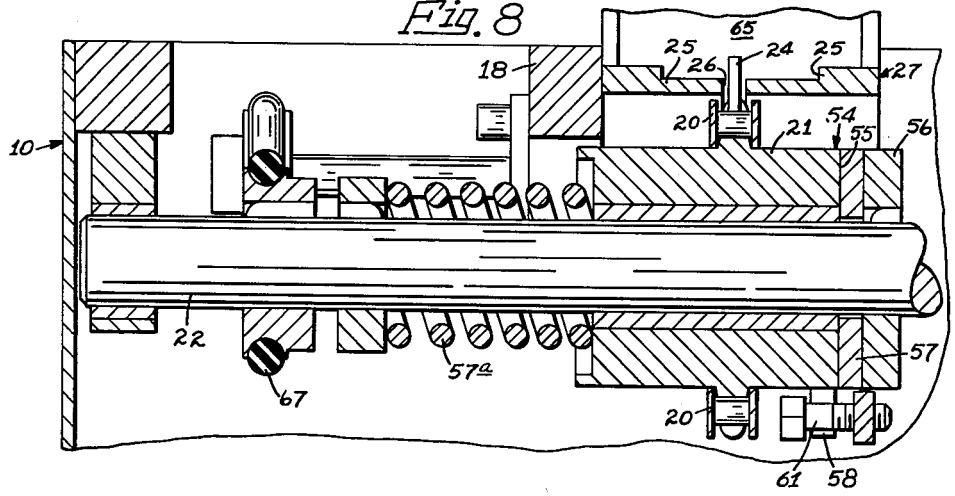

Fig. 9

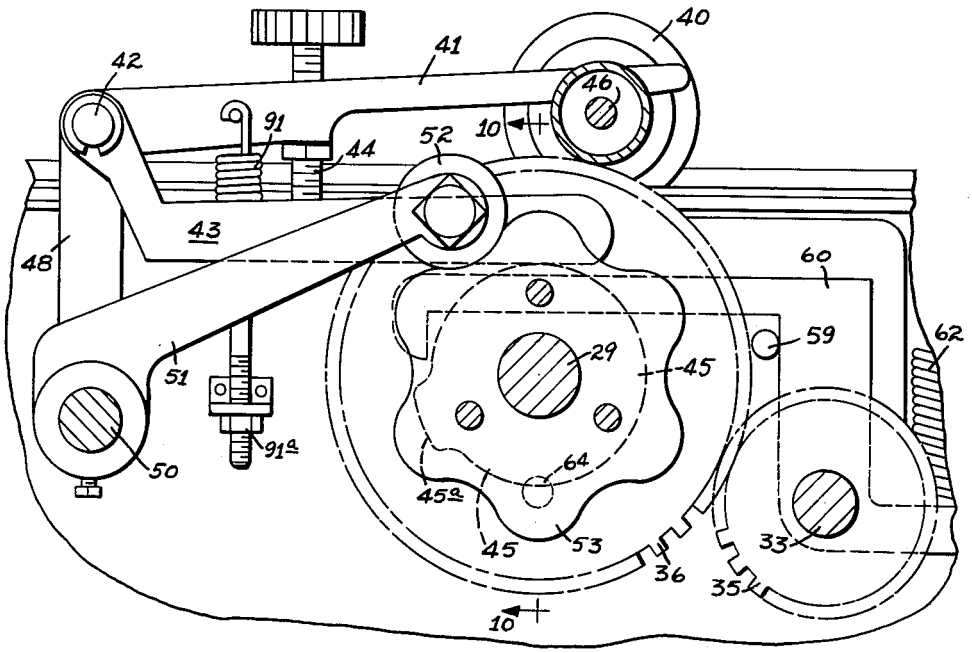

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Fig. 10

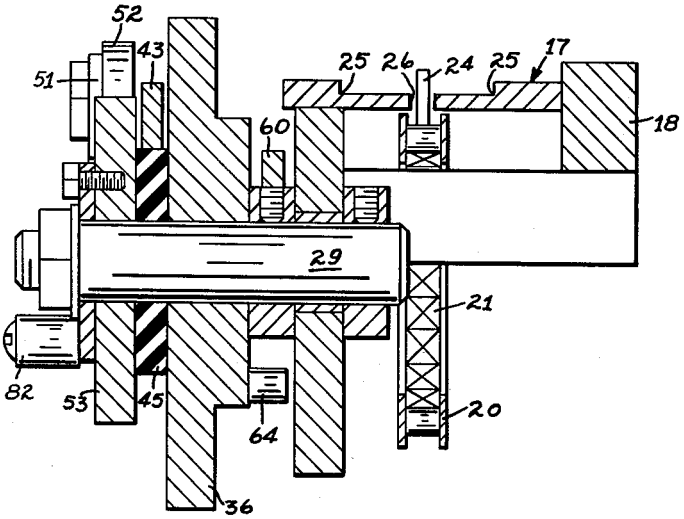

Fig. 11

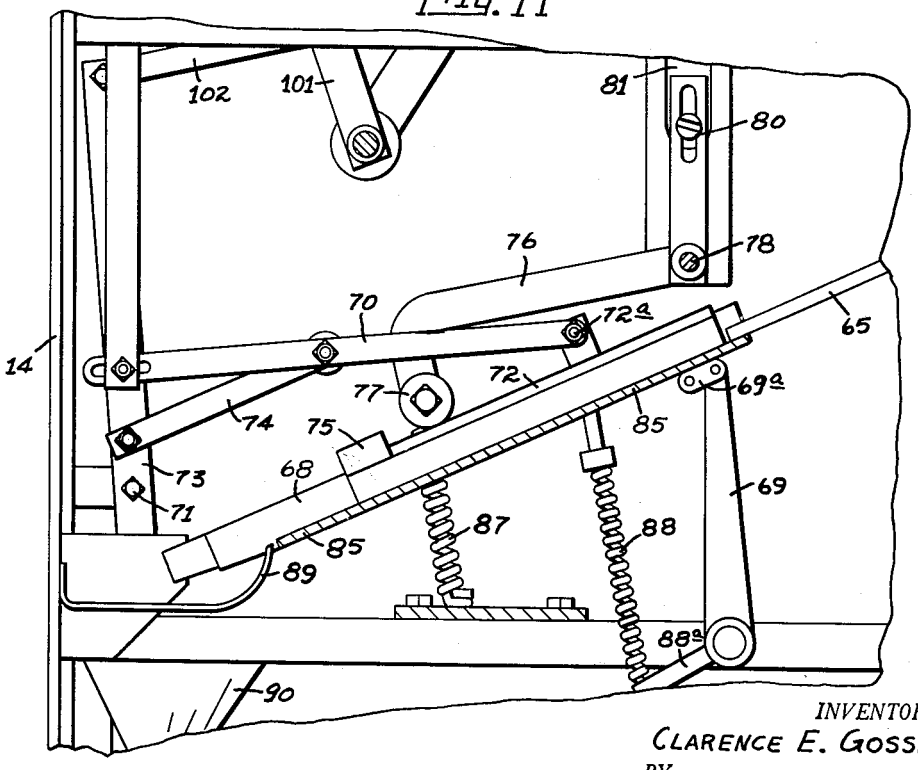

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Fig. 12

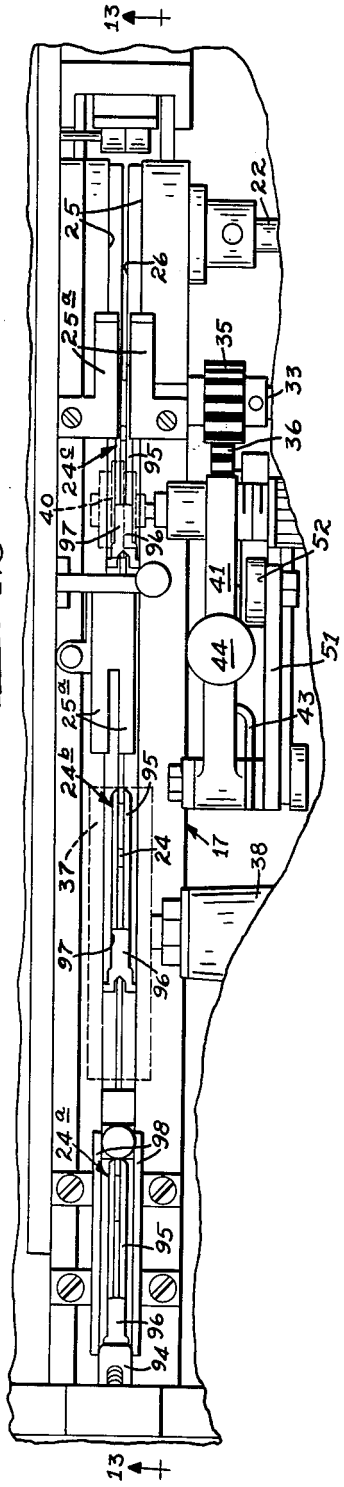
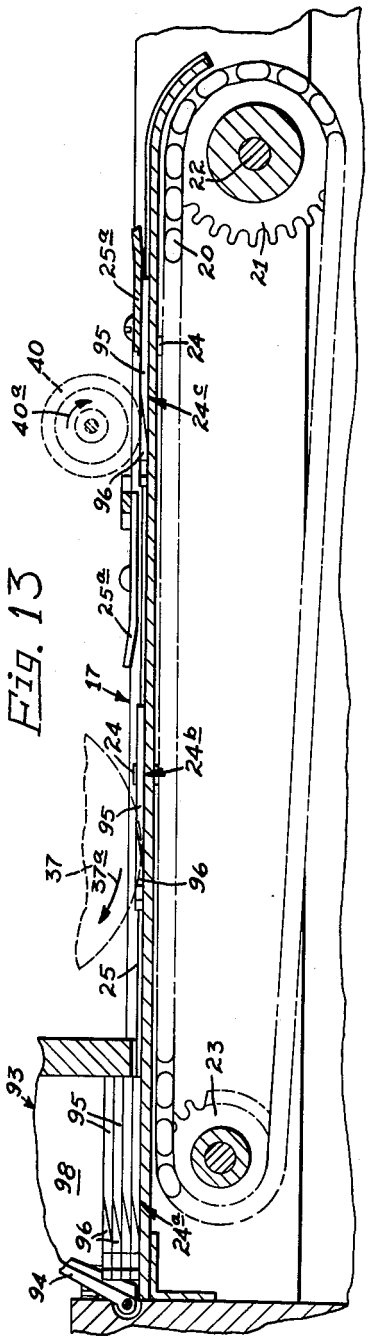


Fig. 13



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United States Patent Office 3,090,057 Patented May 21, 1963

3,090,057

SPACEBAND CLEANER

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Filed Dec. 28, 1961, Ser. No. 162,840
8 Claims. (Cl. 15—4)

This invention relates to a novel machine for cleaning spacebands used in typesetting machines.

The machine described herein has been developed particularly to clean, polish and lubricate spacebands used in the justification of type. The common spaceband uses a short wedge-shaped sleeve which is locked in the line and a relatively slidable member extending below the line. The spacebands collect small deposits of casting metal along their exposed edges. The removal of such deposits has been primarily a manual task, requiring hours of tedious cleaning.

It is a first object of this invention to provide a machine for cleaning spacebands which will be entirely automatic in operation. The machine must clean the entire spaceband, positively remove deposits along the casting edge of the sleeve, and finally lubricate all contacted surfaces with a light coating of dry graphite. The only manual steps required are the loading of the magazine and the unloading of the final receiver.

Another object of this invention is to provide a machine designed to perform successive cleaning steps, the several steps being successively applied to separate spacebands.

A further object of the invention is to provide a simple cleaning arrangement which is easily maintained and repaired when necessary. In this regard, all moving parts of the machine are powered through a single drive, with the exception of the two rotating cleaning wheels. This provision insures effective synchronized speed control by proper motor circuits.

These and further objects will be evident from the following description directed to a preferred embodiment of the invention illustrated in the drawings. This embodiment is merely illustrative of the invention, which is defined in the annexed claims.

In the drawings:

FIGURE 1 is a top plan view of the machine;

FIGURE 2 is a top plan view of the machine with the top cover plates removed;

FIGURE 3 is an enlarged vertical sectional view taken along line 3—3 in FIGURE 2;

FIGURE 4 is a vertical sectional view taken along line 4—4 in FIGURE 2;

FIGURE 5 is an enlarged vertical sectional view taken along line 5—5 in FIGURE 2;

FIGURE 6 is a perspective view of a spaceband;

FIGURE 7 is a side view of the machine with the side covers removed;

FIGURE 8 is an enlarged sectional view taken along line 8—8 in FIGURE 2;

FIGURE 9 is an enlarged view taken along line 9—9 in FIGURE 2;

FIGURE 10 is a sectional view taken along line 10—10 in FIGURE 9;

FIGURE 11 is a vertical sectional view taken alone line 11—11 in FIGURE 5;

FIGURE 12 is a fragmentary enlarged plan view of the track assembly; and

FIGURE 13 is a view taken along line 13—13 in FIGURE 12.

Spacebands are used to justify the lines of type being set up in a Linotype machine. As shown in FIGURE 6, a conventional spaceband 95 comprises a long wedge 95*a* and a slidable sleeve 96. The wedge 95*a* complements sleeve 96 to provide a variable spacing assembly.

In practice, oxides and stains are deposited along the casting face 97 of each spaceband during the usual casting operations. This polished surface must be kept clean for proper use of the spaceband. Stains also are encountered at other points on the spaceband and for this reason, polishing and cleaning of the entire spaceband 95 is desirable. Proper lubrication is also necessary so as to insure relative movement between sleeve 96 and wedge 95*a*. The machine described below is specifically designed to clean and lubricate spacebands properly and efficiently.

The machine as illustrated in the drawings is supported in a rectangular box framework designated generally by the numeral 10. The framework 10 includes the necessary supporting elements which carry a fixed side wall 11, a fixed end wall 12 and two access doors 13 and 14, situated at the remaining side and end of the framework 10 respectively. At the top of the framework 10 are two complementary covers 15 and 16 which complete the overall enclosure. The covers 15 and 16 are formed so as to provide a safety shield over the functional components of the machine as may be seen in the top view illustrated in FIGURE 1. In FIGURE 2 the machine is illustrated with the covers 15 and 16 removed and these covers are not shown in any of the succeeding drawings.

The operational components of the machine extend basically from the top left hand end of the framework 10 as seen in FIGURE 2. A longitudinal guide structure 17 is provided intermediate the two side walls 11 and 13 and is fixed as an integral part of the stationary rectangular framework 10. The guide structure 17 is rigidly supported by a longitudinal brace 18. Guide structure 17 includes a sprocket chain 20 which has an upper flight extending along the top surface of the structure 17 through a longitudinal slot 26. The sprocket chain 20 is situated in a longitudinal position and is entrained about a driving sprocket 21 rotatably mounted on a supporting shaft 22. Shaft 22 extends transversely across the framework 10 and is suitably supported by conventional bearing assemblies.

The remaining end of the sprocket chain 20 is entrained about an idler sprocket 23. The chain 20 is a conventional chain assembly such as those used in bicycles, but in addition includes spaced lugs 24 which protrude at equally spaced intervals along the length of the chain 20 so as to extend upwardly through slot 26 above the top supporting surfaces of the guide structure 17. The guide structure 17 is provided with longitudinal recessed grooves 25 which are designed to engage the side edges of the spaceband 95 so as to guide it longitudinally along the length of the structure 17.

The basic idea contemplated in this machine is the individual feeding and motion of spacebands 95 from a magazine 93 located directly above slot 26 to a final wire receiver 89 located on the hinged end wall 14. The spacebands 95 are loaded in a vertical stack within magazine 93 which is positioned at the left hand end of guide structure 17, as seen in FIGURES 1 and 2. The sleeve 96 faces upwardly as shown in FIGURES 12 and 13. The magazine 93 includes a pair of spaced side plates 98 which are adapted to receive the long wedge 95*a* of each spaceband between them. The magazine 93 further includes a pivoted rear guide 94 which is adapted to abut the end of each spaceband 95 within the rear groove 96*a* provided therein on the slidable sleeve 96. The spacing of the lugs 24 on the chain 20 is identical to the outer circumference of the drive sprocket 21 so that a single revolution of the sprocket 21 will advance each lug 24 an equal distance along the length of the guide structure 17. The mechanism to be described

below provides intermittent motion of the lugs 24 to thereby advance spacebands 95 to the several stations of the machine at selected time intervals.

Sprocket 21 is rotated by a motor 27 and transmission 28 by means of a driving gear 30 at the output end of the transmission 28 and an intermediate driven gear 31 fixed to the shaft 22. Sprocket 21 is not fixed to the shaft 22, but is rotatably mounted thereon. The sprocket 21 comprises a portion of a slip coupling generally designated in the drawings by the numeral 54. The coupling 54 includes a driving plate 56 fixed to the shaft 22, and an opposed surface 55 formed on the sprocket 21. The surface 55 and plate 56 face one another and are separated by a disk 57 of frictional material. The sprocket 21 is urged toward the plate 56 by means of a compression spring 57*a* mounted about the shaft 22. The spring 57*a* exerts sufficient force on the disk 57 to normally provide a one to one drive ratio through the slip coupling 54. However, should the sprocket 21 be mechanically prevented from rotating, the disk 57 will enable it to slip and not retard the rotation of the shaft 22. The means by which this mechanical block is applied will be described below.

The power train utilized to control the various operations of the machine includes a driving gear 32 which is fixed to the shaft 22 adjacent the fixed side wall 11. Gear 32 is in mesh with a driven gear 34 mounted on a transverse shaft 33. The transverse shaft 33 is rotatably mounted in a transverse position on the framework 10 and includes a driving gear 35 which is positioned adjacent the longitudinal guide structure 17. The gear 35 is in direct meshing contact with a control gear 36 mounted on a stub shaft 29, rotatably journalled by the guide structure 17. The control gear 36 operates the various mechanisms which control the operational characteristics of the machine.

The spacebands 95 are engaged by lugs 24 at the front end of an aperture 95*b*. The engaging station is directly below the stack of spacebands 95 in magazine 93 and is designated in the drawings as 24*a*. One revolution of the driving sprocket 25 advances each spaceband 95 to a second station which is designated as 24*b*. At station 24*b* the sleeve 96 and adjacent portions of the spaceband 95 are subjected to frictional engagement by a soft cloth wheel 37 or any suitable brush attachment. The wheel 37 is mounted by a perpendicular drive assembly 38 which may be vertically adjustable and which is powered by a motor 39 mounted on the framework 10. The cleaning wheel 37 is maintained in rotation at a constant speed about a fixed transverse axis located directly above the station 24*b*. The direction of rotation of the wheel 37 is illustrated by the arrow 37*a* in the drawings. The lower surface of the wheel 37 which contacts the sleeve 96 of each spaceband 95 moves oppositely to the direction of motion of the lugs 24. This insures the proper positioning of the sleeves 96 at the rear ends of the spacebands 95.

The third position of the spacebands 95 is at the station designated as 24*c* or the third lug 24 along the guide 17. At this position the previously polished spaceband 95 is subjected to a more vigorous rubbing action along the casting face 97 of the sleeve 96. This rubbing action is designed to remove any metal particles or remaining stains which were left by the casting operation. A small rubber wheel 40 rotating at a high rate of speed, is mounted for rotation about a transverse axis located on a movable support arm 41. The support arm 41 is pivotally mounted about a pin 42 carried by a pivot arm 48. Support arm 41 is subjected to a downward pressure by means of a tension spring 91 anchored by a variable adjustment screw 91*a*. By proper adjustment of the screw 91*a* the tension on spring 91 may be varied to meet the exacting requirement of the rubbing operation. Too little pressure on the sleeve 96 will result in an incomplete cleaning operation, while too great a pressure will eventually produce wear on the face 97 and make the spacebands 95 unusable. The arm 41 is provided with a cam follower 43 mounted directly below it and also pivoted on the pin 42. The cam follower 43 is abutted along its upper surface by a pressure screw 44 threadably engaged through the arm 41. The screw 44 governs the angular separation between the follower 43 and support arm 41 about the pivot pin 42. The rubber wheel 40 is constantly rotated by a motor 46 which is connected to wheel 40 by means of a flexible drive shaft 47. The rotation of the wheel 40 is shown by the arrow 40*a* (FIGURE 13) and also subjects the engaged sleeve 96 to a rearward force so as to maintain its proper position relative to the wedge 95*a* and the engaging lug 24.

The pivot arm 48 which supports the pivot 42 is mounted about a transverse pivotal support 50 on the guide structure 17. The pivotal support 50 includes a crank arm 51 fixed thereto, having a terminal roller 52. The roller 52 is in tangential engagement with a cam wheel 53 fixed relative to the control gear 36, on the shaft 29. The wheel 53 has six rounded lobes which alternately raise and lower the crank arm 51 and thereby pivot the arm 48 about support 50. The cam follower 43 rides tangentially on a cam 45 located between the base of the gear 36 and the cam wheel 53. The shape of the cam 45 is shown in detail in FIGURE 8. It includes a generally circular periphery having a single high spot designated as 45*a*. Thus the lower surface of the cam follower 43 will ride along the peripheral surface of the cam 45 and will be raised only when contacted by the area designated as 45*a*. This contact will cause the follower 43 and therefore the arm 41 to be raised momentarily and then to resume its normal position above the guide structure 17. The action of the crank arm 51 will result in reciprocation of the arm 41 parallel to the groove 26. This insures even cleaning of the entire face 97. The elevational position of the wheel 40 will not vary during this longitudinal reciprocation since the cam follower 43 will merely slide along cam 45 with no change in its elevational structure until struck by the area 45*a*. A spring 92 is connected between the crank arm 51 and the guide structure 17 so as to maintain the roller 52 in proper engagement with the periphery of the cam wheel 53. During this time, the spacebands 95 are securely held within grooves 25 by upper clips 25*a*.

The slip coupling 54 is also directly controlled through rotation of the gear 36. The sprocket 21 is provided with a radial projection 58 on its outer surface. See FIGURE 8. An operating arm 60 is pivotally mounted on the transfer shaft 33 as shown in FIGURE 9. The operating arm 60 has one end thereof located adjacent the driven plate 55. This end of the arm 60 is provided with a projecting screw 61 which extends across the rotative path of the projection 58. The remaining end of the arm 60 extends between the gear 36 and the side surface of the guide structure 17. A pin 64 protrudes from the adjacent surface of gear 36 and is extended so as to abut the lower surface of the arm 60. A spring 62 connected between the arm 60 and the structure 17 maintains the arm 60 in a normal position limited by a fixed stop 59. The stop 59 is located on the structure 17 so as to position the screw 61 directly adjacent the periphery of the surface 55 in order that screw 61 will be abutted by the rotating projection 58. Such abutment will obviously result in the stoppage of the driven plate 55 and therefore will prevent rotative movement of the sprocket 21. The pin 64 is positioned radially on the gear 36 so as to lift the arm 60 about its pivotal axis and therefore allow the projection 58 to clear the screw 61. The lifting interval due to the action of pin 64 is only a fraction of the period required to turn gear 36 one revolution and therefore the screw 61 will be turned to its normal abutting position before the return passage of the projection 58. In this manner the sprocket 21 will be turned only one revolution each time the screw 61 is moved downward.

After traversing the three positons just described, each

spaceband 95 is projected through a curved chute 65 by the continued motion of the lugs 24 along the longitudinal length of the guide structure 17. The chute 65 is designed to receive the spacebands 95 in a longitudinal position and to invert them and direct them back toward the hinged door 14. This action is further aided by a rotating roller 66 which is directly driven from shaft 22 by means of a suitable belt arrangement 67. The roller 66 is preferably formed of a frictional material, such as rubber, so as to enable it to partially fling the spaceband against the curved wall of the chute 65 and thereby hasten its journey to the lower end of the chute 65.

After being cleaned of foreign deposits, each spaceband 95 must be lubricated with graphite so as to be fully prepared for subsequent usage. This is accomplished by the mechanism illustrated at the lower end of the chute 65. It includes a lower block 68 formed of a suitable soft material such as white pine. The block 68 is mounted at its upper end by a support link 69 and a short intermediate link 69*a*. The link 69 is pivotally connected to the framework 10 and maintained in its upper position by a spring 88 acting through a crank arm 88*a*. The remaining end of the spring 88 is connected to an upper block 72. The lubricating assembly is completed by the upper block 72 which is located within the rectangular groove formed on the upper surface of the block 68. The upper block 72 and the lower block 68 are reciprocated by means of a supporting arm 73 which is rotated about a transverse axis on the framework 10 designated by the numeral 71. The two blocks 68 and 72 are reciprocated simultaneously in opposite directions by means of a supporting arm 73. Arm 73 is pivotally connected to the supporting frame of the lower block 68 at the point designated as 68*a*. The upper block 72 is provided with a connecting link 70 which is pivotally connected to the block 72 at 72*a* and which has a lost motion connection to the frame 10 above the pivotal connection 71. A second connecting link 74 extends from the arm 73 to an intermediate connection on the link 70. A counterweight 75 is provided at the lower end of the block 72. Counterweight 75 urges the block 72 downwardly against the supporting surface of the block 68.

In order to admit the spacebands 95 between the two sliding blocks 68 and 72, it is necessary to periodically lift the upper end of the block 72. This is accomplished by means of a crank arm 76 provided with a roller 77 which may selectively contact the lower surface of the link 70 or the upper surface of the block 72. The roller 77 is biased downwardly by a spring 87 connected between the arm 76 and the framework 10. The arm 76 is pivotally mounted on the fixed framework 10 at 78, and includes a lost motion connection 80 which is loosely connected to a cam follower 81. The follower 81 has a crank arm extending adjacent the cam wheel 53 and is adapted to be lifted by contact with a roller pin 82 positioned on the outer surface of the cam wheel 53. Lifting of the cam follower 81 will cause the crank arm 76 to be rotated about pivot 78 and thereby cause the roller 77 to lift upwardly on the link 70, lifting the upper end of the block 72. The lower end of the block 72 will remain loosely in engagement with the block 68 due to the gravitational force exerted through means of the counterweight 75.

The two blocks 68 and 72 are maintained in constant reciprocating motion by means of the arm 73. The arm 73 is pivoted about the support 71 by means of an eccentric driving rod 100 which is pivotally mounted on the driving gear 30 of the transmission 28. The rod 100 pivots a crank 101 mounted on the framework 10. Crank 101 is connected to the upper end of the arm 73 by means of an intermediate connecting link 102.

In order to provide proper lubrication of spacebands 95, a constant supply of powdered graphite must be provided at the upper end of the block 68. This is insured by the provision of the hopper 83 fixed to the framework 10. Hopper 83 has a downwardly extending tube 84 opening directly above the upper surface of block 68. The opening at the lower end of the delivery tube 84 may be suitably adjusted to get the proper flow of graphite and it has been found that the normal vibration of the framework 10 will insure a steady flow of graphite in the desired proportions. If necessary, further vibratory means may be obviously be provided.

At the lower end of the block 68 is provided a final straight delivery chute 85 adapted to receive the spacebands 95 as they emerge from between the two blocks 68 and 72. The chute 85 merely directs the bands 95 to a position about the bent wire receiver 89 mounted on the movable end wall 14. The receiver 89 then engages each spaceband 95 through slot 95*b* and aligns the bands for easy retrieval. A funnel 90 is provided directly below the chute 85 to receive excess graphite which will emerge from between the blocks 68 and 72 so that this material may be reused again in the hopper 83.

The operation of the machine should be evident from the above description. Basically the machine provides a first soft polishing action on the entire spaceband, then a more vigorous rubbing action along the casting edge 97 of the sleeve 96, and finally a graphite lubrication of the spaceband surfaces during the traversal of the band 95 between the blocks 68 and 72. No manual steps are required in the operation of this machine other than the loading of the magazine 93 and the unloading of the receiver 89. The two wheels 37 and 40 are independently driven at high rates of speed so as to make sure of proper cleaning and polishing action. The remaining operations, including the control of the intermittently driven chain 20, are under the direct operational control of a single gear 36. This insures the proper timed relation between the various functions, including the raising and lowering of the wheel 40 and the raising and lowering of the upper sliding block 72. The main driving motor 27 may be provided with any suitable controls and preferably should include a speed control so as to enable the speed of the machine to be varied so as to insure complete cleaning and lubrication of each spaceband. By isolating the speed of the wheels 37 and 40 from the operating controls for the remaining elements of the machine, a variablie speed can be obtained without variations in the speeds of the polishing surfaces. By slowing down the speed of motor 27, one may provide a longer polishing action under the cleaning wheel 37 and a longer cleaning action under the wheel 40, plus a longer period of lubrication between the blocks 68 and 72. In this manner trials may be conducted to establish the optimum conditions necessary in each printing plant where such a machine is utilized.

It is evident that various changes may present themselves to one skilled in this field without deviating from the basic concepts of the invention described herein. For this reason mechanical equivalents are, of course, presumed to be included in the claims which follow. The claims attempt to fully define the scope of my invention and the foregoing description is not intended to limit or restrict the concepts except as they are set out in the claims.

Having thus described my invention, I claim:

1. A cleaning apparatus for type spacebands having a long supporting wedge and a sleeve slidably mounted thereon, the sleeve including a polished casting face along one edge thereof, comprising:

a rigid supporting framework;

a guide track fixed to said framework having a top supporting surface adapted to slidably support a spaceband for longitudinal movement relative to the track;

magazine means mounted on said framework adapted to individually place spacebands on the top supporting surface of said track at one end thereof with the casting face of each sleeve facing upwardly;

means mounted on said framework adapted to intermittently feed spacebands from said magazine means along the top supporting surface of said track to successive first and second operating stations located thereon;

first polishing means rotatably mounted on said framework about a transverse horizontal axis located vertically above the first operating station, said first polishing means being adapted to tangentially contact the upper surfaces of a spaceband located on said track;

second polishing means rotatably mounted on said framework about a transverse horizontal axis vertically above the second operating station, said second polishing means being adapted to frictionally contact the casting face of the sleeve on a spaceband located on said track;

and lubricating means on said framework adapted to coat the surfaces of each spaceband with powdered graphite after emergence from the second operating station.

2. A cleaning apparatus as defined in claim 1 wherein said first polishing means comprises a soft buffing wheel rotatably mounted on said framework and operatively driven by an independent motor;

said second polishing means comprising a small wheel of frictional material mounted on said framework for reciprocation parallel to the guide track, said small wheel being operatively driven by a second independent motor;

and means on said framework operatively connected to said small wheel adapted to effect reciprocation of said small wheel so as to frictionally contact the length of the casting face on each spaceband sleeve at the second operating station.

3. A cleaning apparatus as defined in claim 1 wherein said second polishing means comprises:

a first link pivoted to said framework adjacent said track and extending above the top surface thereof;

a support arm pivotally connected to said first link at the upper end thereof;

a frictional wheel rotatably mounted on said arm directly above the second operating station of said track;

first drive means on said frame operatively connected to said frctional wheel adapted to rotate said wheel about its central axis;

second drive means operatively connected to said first link adapted to pivot said link relative to said framework;

and means on said framework operatively connected to said support arm adapted to elevationally position said support arm relative to said framework.

4. A cleaning apparatus for type spacebands having a long supporting wedge and a sleeve slidably mounted thereon, the sleeve including a polished casting face along one edge thereof, comprising:

a rigid supporting framework;

a guide track fixed to said framework having a top supporting surface adapted to slidably support a spaceband for longitudinal movement relative to the track;

magazine means mounted on said framework adapted to individually place spacebands on the top supporting surface of said track at one end thereof with the casting face of each sleeve facing upwardly;

a chain conveyor having a top flight extending longitudinally directed below the top supporting surface of said track, said track being provided with a slot vertically aligned with the chain conveyor;

a plurality of equally spaced lugs fixed to said chain conveyor and adapted to engage the individual spacebands through the track slot;

intermittent drive means on said framework operatively connected to said chain conveyor adapted to periodically advance the top flight thereof a distance equal to the separation between adjacent lugs;

a frictional rubbing wheel mounted on said framework above said track adapted to engage the sleeves of spacebands along the casting faces thereof;

drive means on said framework operatively connected to said wheel adapted to continuously rotate it about its central axis;

and means on said framework operatively connected to said wheel adapted to lift the wheel from engagement with the sleeves during motion of the top flight of said chain conveyor.

5. The apparatus as defined in claim 4 further comprising:

a soft polishing wheel mounted on said framework above said track adjacent said wheel, said wheel being adapted to contact the upper surface of a spaceband prior to contact with said rubbing wheel;

and drive means operatively connected to said polishing wheel adapted to continuously rotate said wheel about its central axis.

6. The apparatus as defined in claim 4 further comprising:

a pair of soft rubbing blocks mounted on said framework for longitudinal sliding motion relative to one another;

means on said framework adapted to constantly supply powdered graphite between said blocks;

means operatively connecting said track and said blocks adapted to direct spacebands from said track to said blocks after engagement with said wheel;

and means on said framework operatively connected to said blocks adapted to separate said blocks during motion of the spacebands along said last named means.

7. A cleaning apparatus for type spacebands having a long supporting wedge and a sleeve slidably mounted thereon, the sleeve including a polished casting face along one edge thereof, comprising:

a supporting framework;

a guide track fixed to said framework having a supporting surface adapted to slidably support a spaceband for longitudinal movement relative to the track;

magazine means mounted on said framework adapted to individually place spacebands on the supporting surface of said track at one end thereof with the casting face of each sleeve facing outwardly from the track surface;

means mounted on said framework adapted to feed spacebands from said magazine means along the supporting surface of said track to first and second operating stations located thereon;

first polishing means mounted on said framework at said first operating station adapted to tangentially contact the outer surfaces of a spaceband located on said track;

and second polishing means mounted on said framework at said second operating station adapted to frictionally contact the casting face of the sleeve on a spaceband located on said track.

8. A cleaning apparatus for type spacebands having a long supporting wedge and a sleeve slidably mounted thereon, the sleeve including a polished casting face along one edge thereof, comprising:

a rigid supporting framework

a track fixed to said framework having a supporting surface adapted to slidably support a spaceband for longitudinal movement relative to the track;

magazine means mounted on said framework adapted to individually place spacebands on the supporting surface of said track at one end thereof with the casting face of each sleeve facing outwardly;

a chain conveyor having a top flight extending longitudinally directly adjacent the supporting surface of

said track, said track being provided with a slot aligned with the chain conveyor;

a plurality of equally spaced lugs fixed to said chain conveyor and adapted to engage the individual spacebands through the track slot;

drive means on said framework operatively connected to said chain conveyor adapted to periodically advance the top flight thereof a distance equal to the separation between adjacent lugs;

cleaning means mounted on said framework outward of said track adapted to engage the sleeves of spacebands along the casting faces thereof;

and means on said framework operatively connected to said cleaning means adapted to disengage said cleaning means from the sleeves during motion of the top flight of said chain conveyor.

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