The present invention relates generally to an inspection station for wood logs and more specifically to a machine for the alignment, straightening and inspection of wood logs before the latter are sent for processing.

There is generally a need for a machine of this type where wood cutting is not done on a selective basis and where it is intended that classification as to species and quality be done at the mill rather than in the field before cutting.

It is therefore a principal object of this invention to provide a machine to be used for the inspection of logs in regard to species and quality prior to the rejection of undesired logs.

Another object of the invention lies in providing such a machine wherein manual handling of the logs is entirely eliminated whereby the attention of the inspector may completely be directed to his work.

A still further object of the invention is in the provision of a machine of the above type that will move the logs and apply thereto a movement whereby the inspector is capable of assessing the overall quality and nature thereof whereby to separate them accordingly.

Still another object of the invention resides in the provision of such a machine capable of aligning the logs and straightening them before they are either stapled as acceptable or discarded as undesirable.

It is still another object of the invention to provide such a machine that is quite simple in structure and yet can be made of sturdy construction whereby to reduce both the costs of manufacturing and of operation and, because of its simplicity, is easy to operate whereby not to detract the inspector's attention during his work.

These objects may be attained in a machine made according to the invention which comprises an inspection bed formed of a series of inclined parallel rollers rotatable at equal speed and in the same direction, with each roller formed of a cylindrical part and a conical part of the lower end thereof in such a way that the conical part is fittingly jointed to the cylindrical part in the same direction. The cylindrical part of the roll is provided with a helical ridge on the surface thereof which terminates at the adjacent portion, the ridge serving to drive the logs longitudinally of and across the rollers. An upstanding wall is provided along one edge of the machine against which the logs are intended to abut in their lateral displacement across the rollers, the roller being movable in the longitudinal direction of and at the same speed as the logs and terminating in the adjacent portion mentioned above. Finally, a stationary upstanding wall is provided which is in line with the movable wall and on which the ends of the logs abut after leaving the movable wall.

With the above arrangement, the logs are discharged over the above-mentioned inspection bed whence they are rolled on the above-mentioned rollers provided with a helical ridge until the logs reach the V-shaped trough where they then abut the stationary wall.

In this trough, the logs pile up until the coming along of further logs move the foremost logs on the incline provided by the conical part. The incoming logs serve in this respect to straighten the logs which are already aligned at one end by having been driven against the movable wall.

During descend of the logs, the inspector is able to assess the quality of the outer surface thereof and while the logs stand in the V-shaped trough to be straightened, he has an opportunity to inspect the core or heart thereof. After that, he can decide which of the logs should be retained and duly marked or stamped and which are to be rejected.

It is believed that a better understanding of the invention will be afforded by the description that follows of a specific embodiment thereof having reference to the appended drawings wherein:

FIG. 1 is a general perspective view of the inspection station of the invention;

FIG. 2 is a side elevation view of the station of FIG. 1;

FIG. 3 is a plan view of the machine for the alignment, straightening and inspection of the wood logs;

FIG. 4 is a transverse elevation view of the machine of FIG. 3.

The inspection station will be seen to comprise a feeding conveyor 1 adapted to receive logs to be inspected and to discharge them on an inspection bed or table 3 where the inspection operation is carried out in the manner mentioned above, the logs to be thereafter pushed on a discharge conveyor 5 provided with the necessary apparatus for marking the desirable logs and discarding the rejected ones.

Both the feeding and discharge conveyors 1 and 5 are either of the chain or belt type the latter being shown on the drawings by the numeral 9 intended to move the logs in the predetermined direction indicated by arrow a shown in the middle of the inspection bed or table 3 in FIG. 1.

The inspection machine itself comprises an inspection bed constituted by a plurality of spaced generally elongated rollers 11 each formed of a cylindrical part 13 along the major extent thereof and a conical part 15 flaring from the lower end of the cylindrical part 13. Spaced rollers 11 are provided with axles 17 mounted for rotation in bearings 19 secured to a supporting structure 21, the latter being fixed on a machine base 23 in such a manner that the longitudinal axis of rollers 11, with the axes of rotation of axles 17, are similarly inclined in relation to the vertical and downwardly in relation to the general direction of displacement of the logs as indicated by arrow w of FIG. 1.

A motor 25 mounted on the supporting structure 21 has a drive 27 coupling with one end of an axle 17 (see FIGS. 2 and 4). A second drive 29 connects all roller axles together whereby rotation of drive 27 will cause rotation of drive 29 and subsequently rotation of all rollers in the same direction and at the same speed.

A speed reducer 29 is shown between motor 25 and drive 27.

A helical ridge 31 projects from the surface of each roller from the end corresponding to the feeding conveyor 1 to terminate short of the junction between the cylindrical part 13 and the conical part 15.

The cylindrical portions of rollers 11 between the end of ridges 31 and the said junction define with the conical part 15 the above-mentioned generally V-shaped log-receiving trough.

The pitch of the helical ridges 31 is such as to receive a log between consecutive spires thereof.

A first plate 35 bridging the above-mentioned rollers provided with a helical ridge until the logs reach the V-shaped trough where they then abut the stationary wall.

In this trough, the logs pile up until the coming along of further logs move the foremost logs on the incline provided by the conical part. The incoming logs serve in this respect to straighten the logs which are already aligned at one end by having been driven against the movable wall.

An upstanding alignment movable wall 39 is provided along the side of the conveyor toward which the logs are displaced as they are carried in the direction of arrow...
a and under the action of the rotation of rollers 11. It should be noted here that the movable wall 39 terminates in the cylindrical portion 33 forwardly of the ridge 31. An upstanding stationary wall 41 is also provided in alignment with and in the continuation of the movable wall 39 for the abutment of the logs when resting in the V-shaped trough.

Reference to FIG. 3 will show that the first wall 39 preferably terminates in front of the cylindrical portion 33 so that a long, such as log 43 shown in dotted lines, will stand free thereof when it has reached the bottom of the V-shaped trough formed between the conical part 15 and the cylindrical portion 33.

It will be understood from the above description that a log be discharged on the inspection table at an angle in relation to the direction of displacement caused by rollers 11, that inclination will be retained until the log reaches the position of log 43 of FIG. 3. At that time, one end of the log will remain stationary while the other end will be pushed along until the said log 43 is straightened either by the helical ridges 31 or by incoming logs as they ride on the smooth cylindrical portion 33.

Movable wall 39 may be any standard belt conveyor winding around a pair of upstanding rollers 45 one of which is driven by a motor 47 through a speed reducer 49 and by means of a belt drive 51. Once the logs have reached discharge conveyor 5, some will be stamped by a stamping machine 53 and retained thereon while the others will be discarded by being driven through an opening 54 in stationary wall 41 by means of a hydraulic pusher 55.

Although a specific embodiment of the invention has just been described, it will be understood that various modifications may be made thereto without departing from the spirit thereof as set forth in the appended claims. For instance, more rollers 11 may be added if it is found more convenient or if the logs are of a suitable length.

I claim:

1. A machine for the alignment, straightening and inspection of wood logs comprising:
   (a) a series of inclined parallel rollers rotatable at equal speed and in the same direction, said rollers forming a cylindrical part and a conical part at the lower end thereof; said conical part and the adjacent portion of said cylindrical part defining a generally V-shaped log-receiving trough;
   (b) a helical ridge on the surface of each cylindrical part terminating at said adjacent portion; said ridges to drive the logs longitudinally and across said rollers;
   (c) an upstanding wall against which said logs abut in their displacement across said rollers, said wall movable in the direction of displacement of and at the speed of said logs and terminating in said adjacent portion, and
   (d) a stationary upstanding wall next to and in line with said movable wall on which the ends of the logs abut after leaving said movable wall.

2. A machine for the alignment, straightening and inspection of wood logs comprising:
   (a) a travelling conveyor to discharge logs in a predetermined direction; said conveyor formed of a plurality of rollers placed side-by-side with the longitudinal axes thereof parallel to said direction;
   (b) means to mount said rollers to be inclined downwardly in relation to said direction;
   (c) said rollers each formed of a cylindrical part and a conical part at the lower end thereof; said conical part and the adjacent portion of said cylindrical part defining a generally V-shaped log-receiving trough;
   (d) a helical ridge projecting from the surface of each roller and terminating at said adjacent portion;
   (e) means to simultaneously rotate said rollers to cause advancement of the logs in said direction and displacement thereof across said rollers;
(h) means to move said aligning wall along said direction, at the speed of displacement of the logs;
(i) an upstanding stationary wall in line with and in the continuation of said movable wall for the abutment of logs when resting in said V-shaped trough;
(j) a discharge conveyor having a log receiving end at the outlet of said V-shaped trough;
(k) a first plate bridging the gap between the discharge end of said feeding conveyor and the adjacent end of said travelling conveyor to guide logs therebetween;
(l) a second plate bridging the gap between the discharge end of said V-shaped trough and the receiving end of said discharge conveyor to guide logs therebetween.