S. M. LANGSTON.

MACHINE FOR MAKING CELLULAR BOARDS.

APPLICATION FILED JULY 28, 1908.

916,170.

Patented Mar. 23, 1909.

2 SHEETS—SHEET 1.

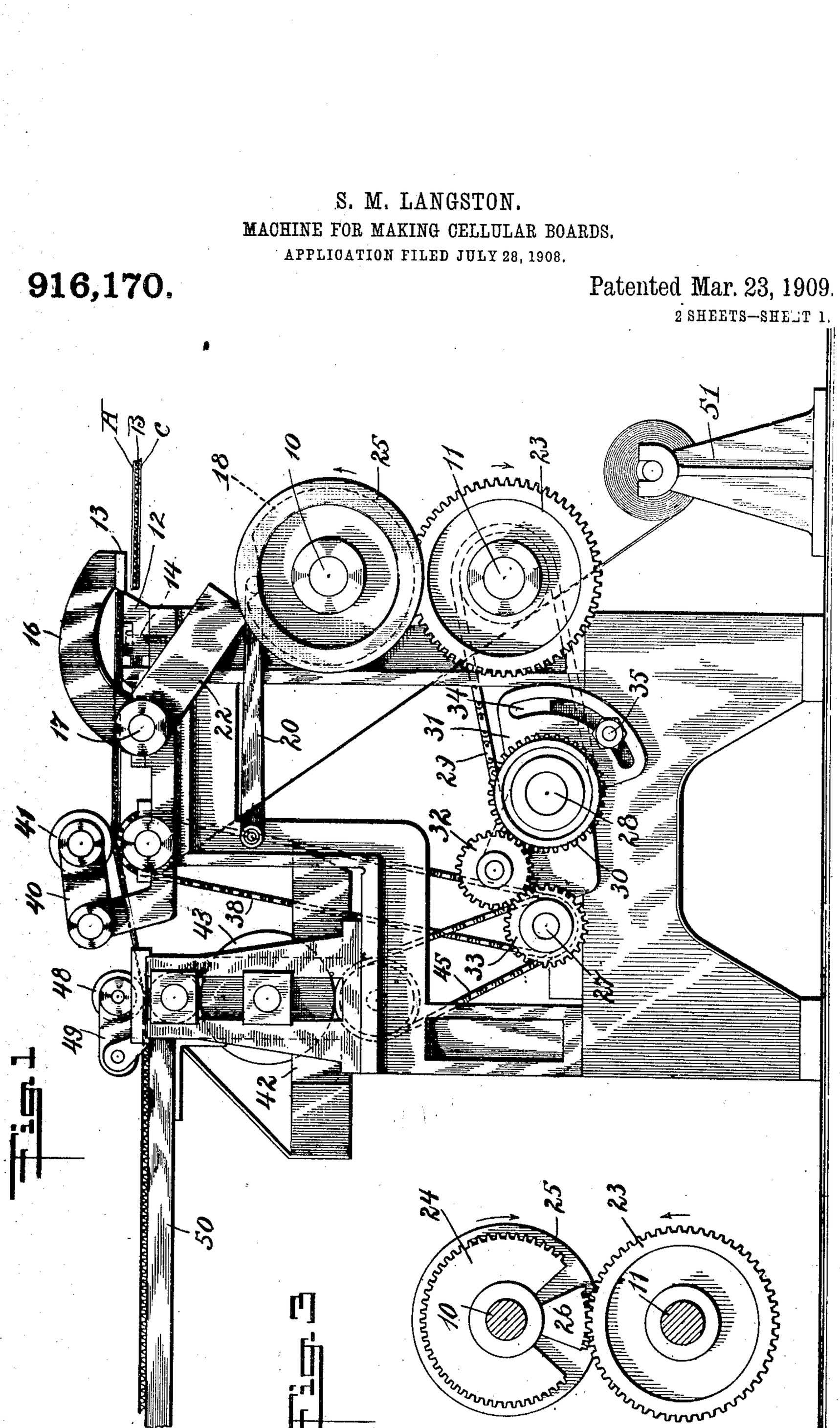

FIG. 1.

FIG. 3.

WITNESSES

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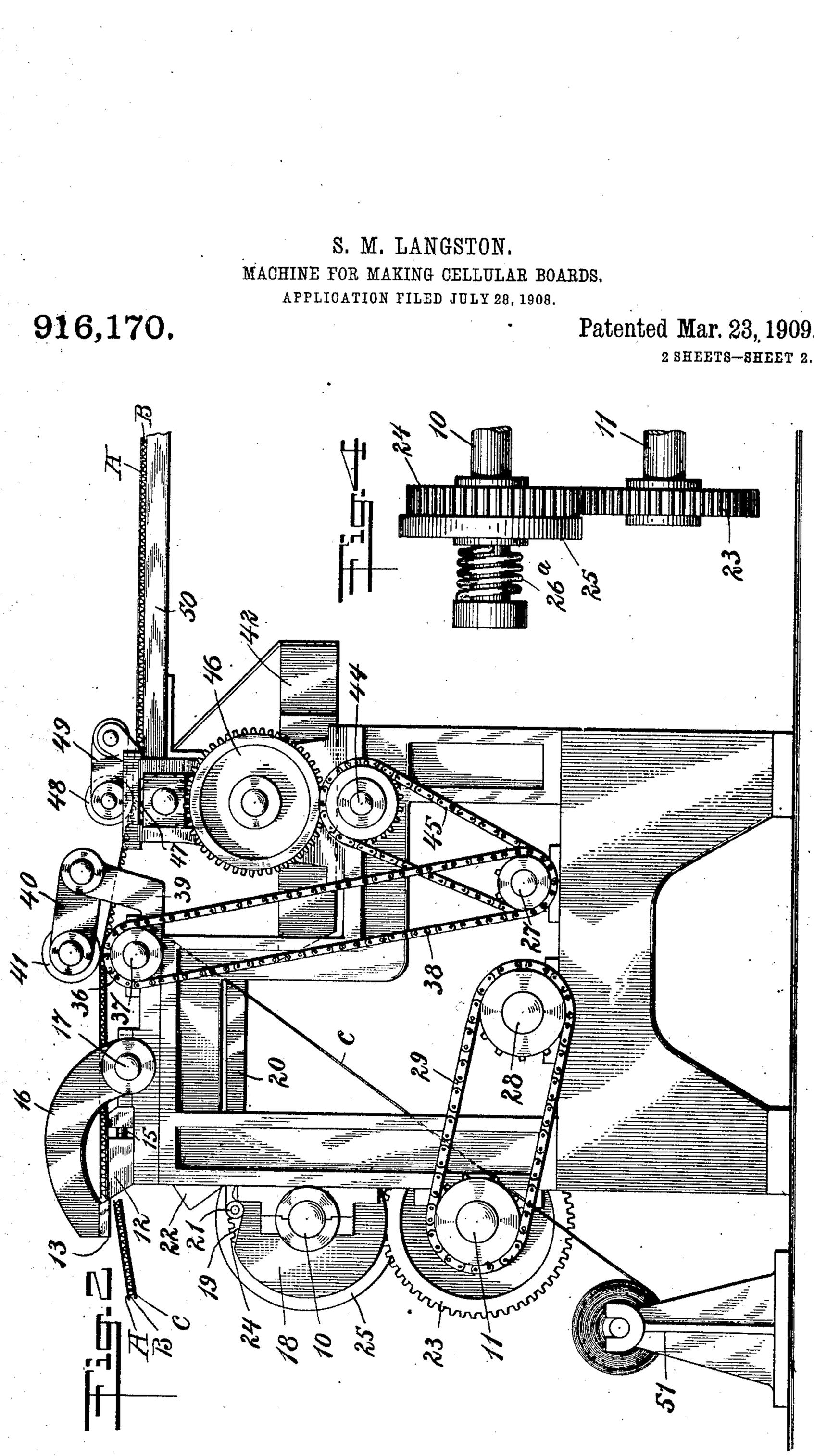

FIG. 2.

WITNESSES

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UNITED STATES PATENT OFFICE.

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MACHINE FOR MAKING CELLULAR BOARDS.

No. 916,170. Specification of Letters Patent. Patented March 23, 1909.

Application filed July 28, 1908. Serial No. 445,747.

To all whom it may concern:

Be it known that I, SAMUEL MACDONALD LANGSTON, a citizen of the United States, and a resident of Camden, in the county of Camden and State of New Jersey, have invented a new and Improved Machine for Making Cellular Boards, of which the following is a full, clear, and exact description.

This invention relates to certain improvements in machines for making cellular board or double-faced corrugated paper, and relates more particularly to a machine for applying the second facing sheet to the single faced corrugated paper and subdividing the resulting product into sections.

The object of the invention is to provide a simple form of machine in which a single frame or base supports all of the operating parts, and in which the adhesive applying mechanism and the feeding mechanism are operated intermittently from a continuously operated drive shaft, the cutting mechanism being also operated from said drive shaft and serving to subdivide the material during the interval while the feeding mechanism and adhesive mechanism are out of operation.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of one embodiment of my invention; Fig. 2 is a side elevation showing the side opposite to that shown in Fig. 1; and Figs. 3 and 4 are details showing the lost motion mechanism preferably employed.

In the specific form illustrated in the accompanying drawings, I provide a main frame which serves to support all of the operating parts of the machine. These operating parts include the adhesive applying mechanism, the feeding mechanism, the cutting or subdividing mechanism, and the operative connections for driving and controlling each of these mechanisms. At one end of the frame there is mounted the main drive shaft 10 which may be operated from any suitable source of power. The shaft is disposed at the outlet or discharge end of the machine and serves to transmit motion to a second shaft 11 directly below the same. The shaft 11 is operated intermittently from the shaft 10 and both the adhesive applying mechanism and the feeding mechanism are operated directly from the shaft 11, the cutting mechanism being operated directly from the shaft 10.

The cutting mechanism as shown, comprises two blades, one a normally stationary blade 12, and the other a movable blade 13. The blade 12 is mounted upon the top of the machine and may be held to the frame in any suitable manner, as for instance, by set screws 14 shown in dotted lines in Fig. 1. The blade may be adjusted longitudinally of the frame upon the loosening of the screws 14, by means of regulating screws 15 engaging with the rear edge of the blade. The upper surface of the blade constitutes a support for the material to be subdivided, and the rear surface of the blade is under-cut to present a cutting edge in the plane of the upper surface. The blade 13 is carried by two arms 16 secured to a rock shaft 17 below the plane of the upper surface of the blade 12 and back of the rear edge thereof. The arms 16 are a greater distance apart than the material operated upon, so that said material passes above the rock shaft 17 and between the arms 16 to the upper or supporting surface of the blade 12. The blade 13 is carried by the arms 16 at their outer ends and is so disposed that when said arms are lowered, the edge of the blade comes adjacent the edge of the blade 12 to subdivide the material, as indicated in the drawings. For operating the rock shaft 17, the main drive shaft 10 is provided with a cam 18, the major portion of the outer periphery of which lies in the circumference of a circle. At one side, the cam is provided with a recess or reëntrant portion 19, one side of which is disposed at a comparatively sharp angle to the periphery. Pivoted to the frame intermediate the ends thereof, I provide an arm 20 having at the free end thereof a roller 21 resting upon the cam 18. Rigidly secured to the rock shaft 17 is a second arm 22, the free end of which rests upon the arm 20 adjacent the free end of the latter. As the drive shaft 10 and the cam 18 rotate, the roller 21 follows the periphery of the cam and normally holds the arms 20, 22 and 16 in their raised position so that the material may pass beneath the blade 13. As the roller reaches the recess 19 in the cam, the arms drop and the blade 13 operates in conjunction with the blade 12 to sever that portion of the material extending

beyond the edge of the last mentioned blade. The arm 22 not only serves to oscillate the rock shaft 17 but it preferably also constitutes a weight for more effectively bringing the blade 13 into operation.

Any suitable lost motion mechanism may be employed for transmitting motion from the main drive shaft 10 to the shaft 11. Preferably, I employ mechanism similar to that disclosed in my prior patent, No. 878,403, granted February 4, 1908. This mechanism includes a gear wheel 23 rigidly secured to the shaft 11 and a mutilated gear 24 rigidly secured to the shaft 10. The gear 24 is provided with a sector-shaped recess therein, and adjacent said gear is a disk 25 having a sector-shaped projection 26 upon the side thereof and extending into the recess of the gear 24. The projection 26 is provided with teeth upon its outer surface, which form a continuation of the teeth of the gear 24, but such projection is of smaller angularity than the recess, so that the disk 25 may be rotated a limited distance in respect to the gear 24. The disk is provided with an actuating spring 26^a which normally tends to rotate it in one direction to keep the sector-shaped projection against one side of the recess. While the teeth of the gear 24 are in mesh with the teeth of the gear 23, the shaft 11 is rotated, but as soon as the teeth of the sector-shaped projection 26 come into mesh with the gear 23, said projection and said gear stop and remain stationary while the shaft 10 and the gear 24 continue to rotate, to bring the further side of the recess against the side of the projection. The projection then becomes an effective portion of the gear 24 and the gear 23 starts rotating. As soon as the teeth of the projection 26 are out of mesh with the gear 23 the spring 26^a rotates the disk to advance the projection to the forward side of the recess.

Mounted within the main frame is a shaft 27 from which motion is transmitted to both the adhesive applying mechanism and the advancing or feeding mechanism. This shaft is driven from the shaft 11 but this driving mechanism includes means for varying the relative rates of rotation. Intermediate the shaft 11 and the shaft 27 is a shaft 28 driven directly from the shaft 11 by a chain 29 and suitable sprockets upon the two shafts. At one end of the shaft 28 is a gear wheel 30, and pivoted upon the shaft is a plate 31. The plate carries a pinion 32 continuously in mesh with the gear 30 and adapted to engage with a pinion 33 upon the shaft 27. The plate 31 may be rotated about the shaft 28 as an axis, to bring the pinion 32 into or out of engagement with the pinion 33, and the last-mentioned pinion is so mounted as to be readily detachable. Any sized pinion desired may be inserted in place of the pinion 33, and the plate 31 may be moved to bring the pinion 32 into mesh therewith. By putting on different sized pinions 33, the shaft 27 may be rotated at any desired rate of speed in respect to the shaft 28. The plate 31 may be rigidly secured in position in any suitable manner, as for instance, by being provided with a curved slot 34 concentric with the shaft 28 and receiving a threaded stud 35 extending outwardly from the frame. A nut screwed upon the stud 35 may bind the plate 31 in its adjusted position.

The advancing or feeding mechanism serves not only to deliver the material to the cutting mechanism, but it also serves to bring the second facing sheet or strip into engagement with the adhesive covered crowns of the single faced cellular board or corrugated paper. The feeding mechanism includes a roller 36 mounted in the upper portion of the machine and having its upper surface substantially in the plane of the upper surface of the blade 12. The roller may be of any suitable material but is preferably roughened or covered with a layer of rubber, in order to frictionally engage with the material to advance the same. The roller is mounted on a shaft 37 which latter is driven directly from the shaft 27 through a chain 38 and suitable sprocket wheels. Extending upwardly from the frame, adjacent the roller 36 are two arms or brackets 39 serving to pivotally support at their upper ends two arms or links 40. At the free end of the latter is a second roller 41 directly above the roller 36 and parallel thereto, and serving through its weight to hold the material in engagement with the feeding roller 36.

Carried by an auxiliary frame secured to the main frame, and disposed at a lower level than the advancing mechanism and the cutting mechanism, I provide a tank or container 42 adapted to receive the adhesive material. Any suitable material may be employed but I preferably use silicate of soda. Mounted directly above the container 42 is a drum 43, the lower edge of which dips into the adhesive within the container. Directly below the container I provide a shaft 44 driven from the shaft 27 through a chain 45 and suitable sprocket wheels, and on the shaft 44 is a gear intermeshing with a gear 46 on the shaft of the drum 43.

Mounted directly above the drum 43 and driven thereby is an intermediate drum or adhesive applying roller 47, the lower edge of which contacts with the upper edge of the drum 43, and the upper edge of which serves to deliver the adhesive to the crowns of the corrugations of the single faced cellular board. The material is held in engagement with the adhesive applying roller 47 by a second roller 48 directly above the roller 47 and mounted upon the free ends of pivoted arms 49. The rollers 43, 47 and 48 are carried by an auxiliary frame secured to the main frame and

this auxiliary frame serves to support a feed table or platform 50, the upper surface of which is in substantially the same plane as the upper edge of the roller 47. The material, which includes an upper facing A and a corrugated sheet B is fed along the table or platform 50. As this single faced cellular board passes between the rollers 47 and 48, adhesive material is applied to the crowns of the corrugations of the sheet B. This adhesive material has time to partially dry as the material travels from the roller 47 to the feeding or advancing roller 36, but as it comes to the last mentioned roller it also comes into contact with the second or under facing strip or sheet C. The latter is fed from a roll mounted in any suitable form of support 51 and passes directly over the roller 36, so that the latter operates to not only advance the material but to also deliver the facing strip C into engagement with the adhesive carrying corrugated strip B. The rollers 36 and 41 force the strip C firmly against the crowns of the corrugations, and deliver the assembled parts to the cutting mechanism by which it is subdivided as is hereinbefore set forth.

It will be noted that in my improved machine the main drive shaft 10 operates continuously and that the cutter operates directly from this continuously operating shaft. The adhesive applying mechanism and the feeding mechanism operate simultaneously and intermittently and at the same speed. By changing the pinion 33, the speed of both the adhesive applying mechanism and the feeding mechanism may be varied to vary the size of the sections cut off by the cutter 13. Thus the corrugations are coated uniformly with adhesive, irrespective of the speed at which the material is fed, and the cutter operates at a uniform rate, also, independently of the speed at which the material is fed. The length of the recess in the cam 18 bears such a relationship to the recess in the gear 24 and the size of the projection 26 that the material remains stationary during the cutting action, and the intervals of rest in comparison with the time required to cut off each section are unaffected by changes in the speed at which the material is advanced.

Having thus described my invention, I claim as new, and desire to secure by Letters Patent:

1. In a machine of the character described, an adhesive applying roller, a feeding roller, a shaft, means for driving both of said rollers at the same speed from said shaft, and means for rotating said shaft intermittently.

2. A machine of the character described, including an adhesive applying roller, a feeding roller, subdividing mechanism, a continuously rotating drive shaft, a shaft for operating said adhesive applying roller and said feeding roller, lost motion connections between said last-mentioned shaft and said drive shaft, and means for operating said subdividing mechanism directly from said drive shaft.

3. A machine of the class described, including an adhesive applying roller, a feeding roller, subdividing mechanism, a continuously rotating drive shaft, a shaft for operating said adhesive applying roller and said feeding roller, lost motion connections between said last-mentioned shaft and said drive shaft, means for varying the relative rates of rotation of said shafts, and means for operating said subdividing mechanism directly from said drive shaft.

4. A machine for making cellular board, including a movable cutting blade, a feeding roller delivering thereto, a drive shaft, lost motion connections between said drive shaft and said feeding roller, whereby the latter operates intermittently, a rock shaft in the rear of said cutting blade and below the plane of the work, arms connecting the ends of said rock shaft to the ends of said cutting blade, and means driven by said drive shaft for intermittently oscillating said rock shaft.

5. A machine for making cellular board, including a movable cutting blade, a feeding roller delivering thereto, a drive shaft, connections between said drive shaft and said feeding roller, a rock shaft in the rear of said cutting blade and below the plane of the work, arms connecting the ends of said rock shaft to the ends of said cutting blade, and means driven by said drive shaft for intermittently oscillating said rock shaft, said means including a cam continuously driven by said drive shaft and an arm connected to said rock shaft and in engagement with said cam.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SAMUEL M. LANGSTON.

Witnesses:
ROBERT JENNETT.
CARL D. EVANS.