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MEANS FOR TURNING GIRTS IN LOOP DRIERS

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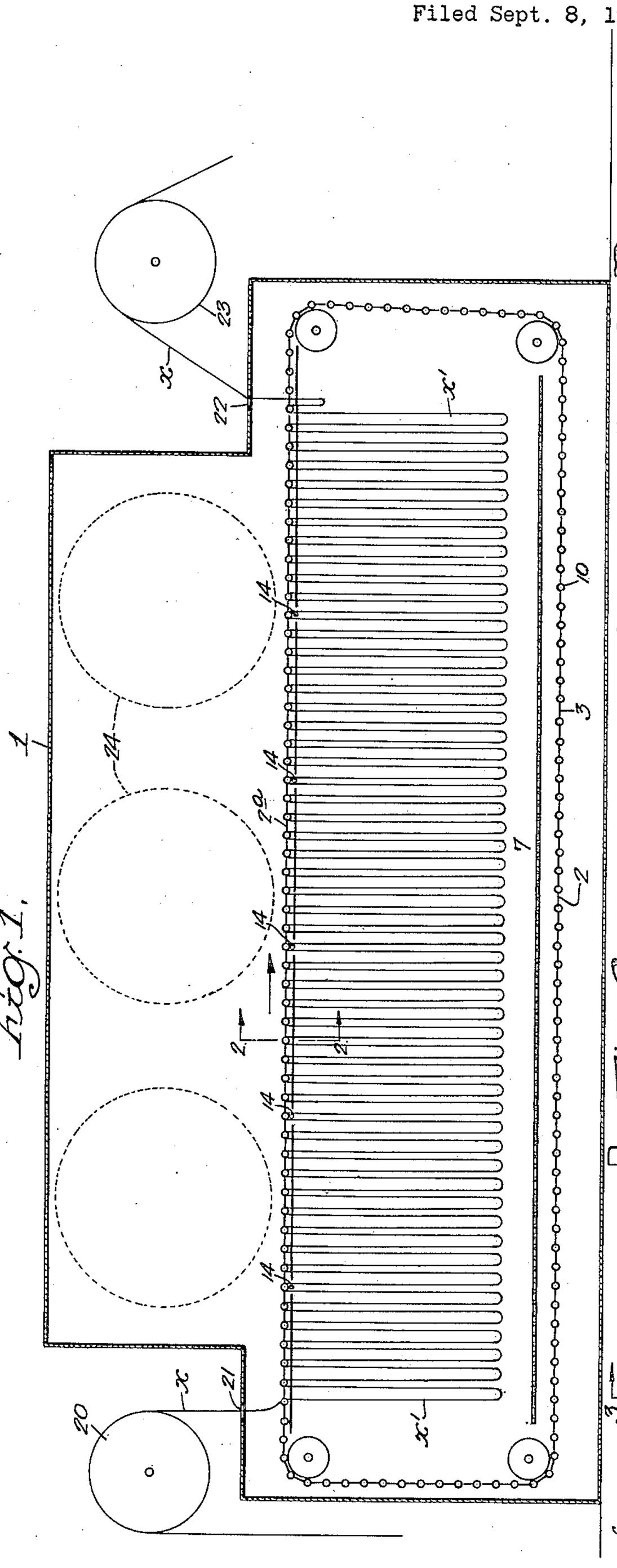


Fig. 1.

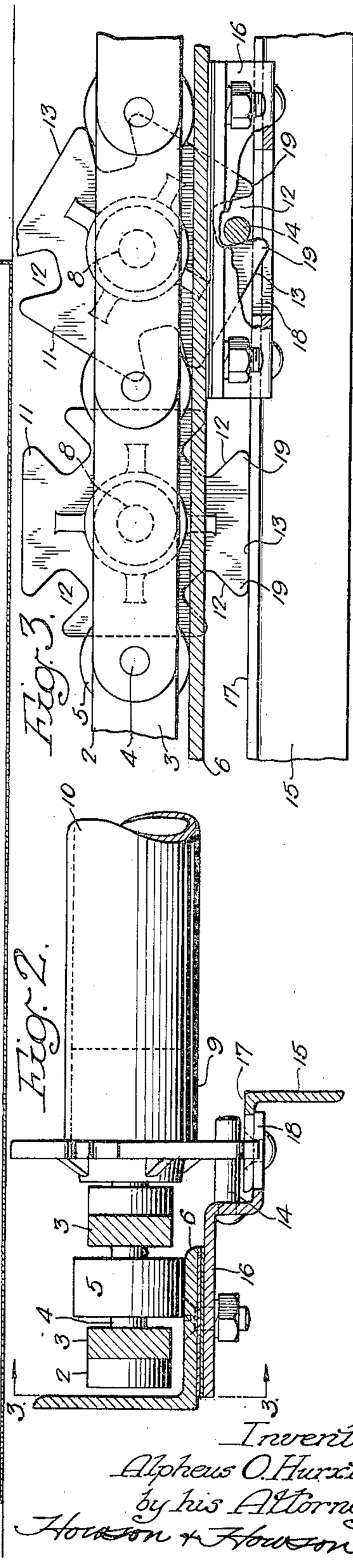


Fig. 3.

Fig. 2.

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MEANS FOR TURNING GIRTS IN LOOP DRIERS

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5 Claims. (Cl. 34—12)

This invention relates to driers for cloth, paper and other materials in continuous web form. The present invention particularly concerns what is known in the art as a loop drier, i. e., a drier wherein the web is hung in loops or festoons on and between a series of laterally spaced poles or sticks which are supported at their opposite ends on constantly or intermittently moving side conveyers by which the poles and loops are transported through a suitable drying chamber.

In some instances the poles are rotatably mounted at the opposite ends thereof in suitable bearings respectively fixed to the side chains and each pole is provided with a gear or star wheel at one or both of its ends for cooperation with gear racks or trip pins disposed along the path of movement of the poles, whereby the poles are either continuously or intermittently rotated as the drying of the web progresses, in order to prevent marking of the material by constant contact thereof with the poles.

Constant rotation of the poles has been found to be unnecessary and detrimental, due to the fact that the movement of the cloth or other web by rotation of the girts is not positive. Therefore, excessive rotation of the girts tends to increase the possibilities of producing loops of unequal lengths, causing slippage of comeplete loops to the floor of the drier which results in damage to the goods and faulty operation of the drier. The web requires but slight intermittent shiftings relative to the girts to prevent the formation of "stick marks."

The use of gears with longitudinally spaced gear rack sections and the use of star wheels with trip pins spaced longitudinally of the path of movement of the poles, for effecting intermittent rotation of the poles, is objectionable in that proper indexing of such elements at each of the various points along the route is difficult and frequently results in jamming of the conveyers and injury to the mechanical parts and to the material being dried.

Another objection to the free rotation of the poles intermediate the turning stations is that, should any of the poles become warped, bent or otherwise unbalanced, such pole, after each intermittent rotation of less than 360° tends to swing either backwardly or forwardly to the position it held before such turning, thereby throwing the pole or poles and loops carried thereby out of synchronation and uniformity with the remaining poles and loops of the series thereof.

The object of this invention is to provide a simple and efficient means for controlling the poles, or girts, to provide intermittent rotations of substantially 90° each for each pole and to prevent free rotation of the poles intermediate such turnings, all as will be fully disclosed hereinafter, reference being had to the accompanying drawing, of which:

Fig. 1 is a diagrammatic longitudinal sectional elevation of a loop drier equipped in accordance with the principles of the present invention;

Fig. 2 is an enlarged transverse sectional elevation taken on the line **2—2**, Fig. 1; and

Fig. 3 is a longitudinal sectional elevation taken on the line **3—3**, Fig. 2.

In Fig. 1 of the accompanying drawing, the casing of a usual form of loop drier is diagrammatically illustrated at **1**. One of the side chains, of which there is one at each side of the drier to form a complete pole carrying conveyer, is illustrated at **2**.

As ilustrated in Figs. 2 and 3, each of the pole carrying chains **2** comprises a series of laterally spaced side links **3**, **3** pivotally connected by pintles **4** which, in addition to forming the pivots between adjacent links, provide a bearing or axles for rollers **5**, **5** by which the conveyer is supported on laterally spaced longitudinally extending rails **6**, **6** disposed respectively adjacent the opposite sides of the drying chamber **7** within the drier casing **1**.

Projecting laterally from each or predetermined ones of the inside links **3***a* of each of the carrier chains **2**, **2**, are studs **8** which are secured in the links **3***a* and afford rotary support or bearing for the opposite ends **9**, **9** of each of the poles or girts **10**, which latter extend transversely of the drying chamber **7** between the parallel side chains **2**, **2**.

One or each of the ends **9**, **9** of each girt **10** is provided with a rectangular plate or wheel **11** having diagonal corner slots **12**, **12** radiating from the axis of girt **10** and connected at their outer ends by flat surfaces **13**, **13** forming the outline or periphery of the rectangular wheel **11**.

At predetermined spaced intervals along the upper run **2***a* of the conveyer **2** is a series of studs or pins **14** which, as the conveyer **2** advances and carries with it the poles **10** and square wheels **11**, enter the lower forwardly extending corner slots **12**, causing the square wheel **11** and the pole attached thereto to turn to the extent of 90°.

In order to prevent the flat-sided wheels 11 and poles 10 from turning more than 90° and to keep them from wolvering freely between such 90° rotations, a guide rail 15 is provided in spaced parallel relation to one or each of the supporting rails 6 and is secured to said supporting rail at spaced intervals longitudinally thereof by brackets 16, which latter also provide support for the pole rotating studs 14.

The guide rail 15 in each instance is preferably set just below the lowermost of the horizontally disposed surfaces 13 on the pole rotating wheels 11, with a slight clearance between the upper surface 17 of the guide rail 15 and said lowermost surfaces 13 of the wheels 11. Any tendency that the poles 10 may have to rotate intermediate the prescribed points at which the 90° rotations of the poles occur will be arrested by one of the ends or corners 19 of the lower flat surface 13 of the wheel 11 of such pole engaging and riding on the upper surface 17 of the guide rail 15.

In order to permit of the 90° rotations of the poles 10 at the above noted prescribed points, the rail 15 and the bracket 16 at each of the turning studs 14 are correspondingly recessed as indicated at 18 in Figs. 2 and 3 to provide clearance for the points or corners 19 where the flat faces 13 of the wheels 11 intersect with the angular side walls of the corner slots 12 of said wheels, as clearly shown in Fig. 3.

As shown in Fig. 1, the web X to be dried is fed by a drum or roll 20, through a feed opening 21 in the casing 1, into the spaces between adjacently disposed poles 10, 10 and as the conveyer 2 advances the poles in the direction of the arrow Fig. 1 the material X is draped over the advancing pole and falls between that and the next succeeding pole to form the material into successive loops or festoons X' between the poles.

As the poles advance the lower inclined surface of the lower forward corner slot 12 of each flat wheel 11 associated with each pole 10 engages the stationary turning studs 14 one after another at the predetermined turning points respectively, whereby each pole, in turn, is given a quarter-turn in one direction as many times as may be necessary during the travel of the loops X' through the drying chamber 7 to prevent marking of the web by prolonged contact of the same parts of the web with the supporting girts 10.

At the far end of the casing 1 the web is drawn out of the loops X' and through a discharge opening 22 of the casing by any suitable means such as the drum or roll 23. Heated air is normally circulated through the casing 1 as by fans 24, being heated in circulation by any of the well known devices, such as steam coils, placed in the path of movement of the air.

While the wheels 11 have been shown as being four-sided, to give the poles the quarter-turns above noted, it is obvious that these turning wheels may have any desired number of flat sides and radial slots to turn the poles to any desired degree at each of the turning points; and while the guide rail 15 has been shown as being disposed below the path of movement of the wheels 11 it is obvious that said rail can be placed above the wheels with equal effectiveness.

I claim:

1. The combination in a loop drier, of a conveyer comprising loop supporting girts, means on the girts having perimetrical flat surfaces and radial recesses, means arranged to enter said recesses for intermittently partially rotating the girts, and means adapted to be engaged by said flat surfaces to prevent turning of the girts intermediate said partial rotations.

2. The combination in a loop drier, of a conveyer comprising loop supporting girts, end wheels on the girts having perimetrical flat surfaces and radial recesses, means arranged to enter said recesses for intermittently partially rotating the girts, and means adapted to be engaged by said flat surfaces to prevent turning of the girts intermediate said partial rotations.

3. The combination in a loop drier, of a conveyer comprising looping supporting girts, means on the girts having perimetrical flat surfaces and radial recesses, studs disposed adjacent the path of the conveyer and arranged to enter said recesses for intermittently partially rotating the girts, and means adapted to be engaged by said flat surfaces to prevent turning of the girts intermediate said partial rotations.

4. The combination in a loop drier, of a conveyer comprising loop supporting girts, means on the girts having perimetrical flat surfaces and radial recesses, means arranged to enter said recesses for intermittently partially rotating the girts, and a guide rail adjacent and paralleling the path of the conveyer and adapted to be engaged by said flat surfaces to prevent turning of the girts intermediate said partial rotations.

5. The combination in a loop drier, of a conveyer comprising loop supporting girts, end wheels on the girts having perimetrical flat surfaces and radial recesses, studs disposed adjacent the path of the conveyer and arranged to enter said recesses for intermittently partially rotating the girts, and a guide rail adjacent and paralleling the path of the conveyer and adapted to be engaged by said flat surfaces to prevent turning of the girts intermediate said partial rotations.

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