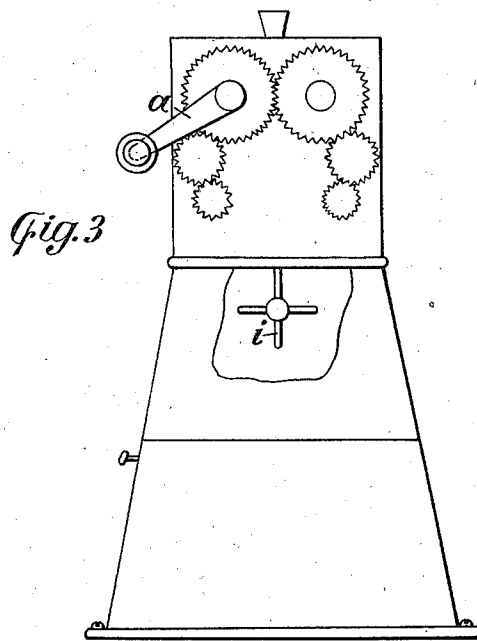
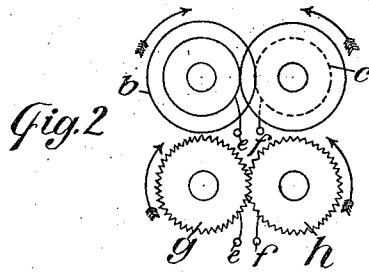
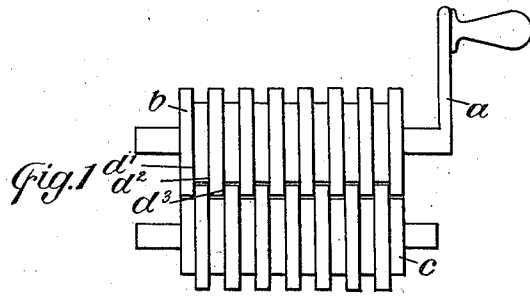


F. GÜETTLER.
PAPER COMMUNTING MACHINE.
APPLICATION FILED MAR. 6, 1912.

1,090,914.

Patented Mar. 24, 1914.

2 SHEETS-SHEET 1.



Witnesses
C. X. Waller
L. G. Anger

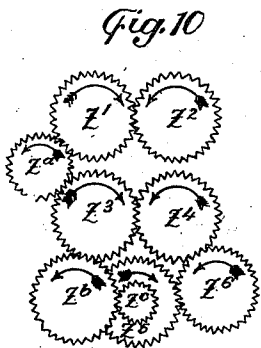
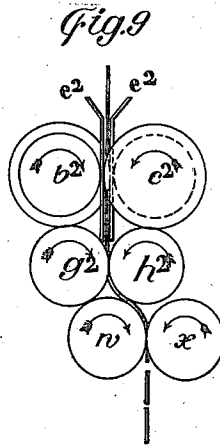
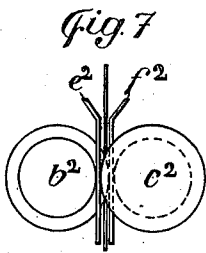
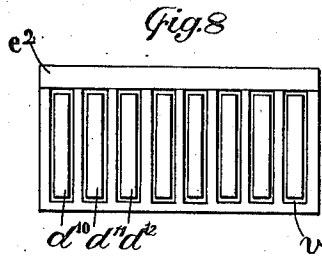
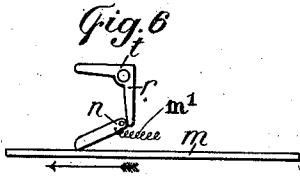
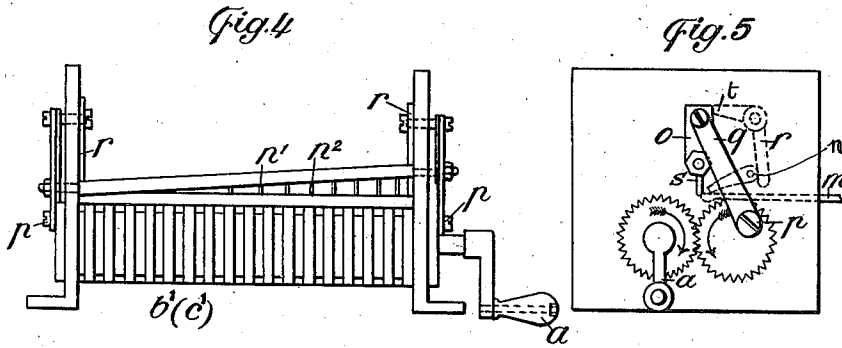
Inventor
Fritz Güttler
by *W. H. Adair*
Attorney

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2 SHEETS—SHEET 2.



Witnesses
 C. A. Waller
 L. G. Anger

Inventor
 Fritz Güettler
 by R. M. Adelman
 Attorney

UNITED STATES PATENT OFFICE.

FRITZ GÜETTLER, OF FRANKFORT-ON-THE-MAIN, GERMANY.

PAPER-COMMINUTING MACHINE.

1,090,914.

Specification of Letters Patent. Patented Mar. 24, 1914.

Application filed March 6, 1912. Serial No. 681,951.

To all whom it may concern:

Be it known that I, FRITZ GÜETTLER, a subject of the King of Prussia, residing at Frankfort-on-the-Main, in Germany, have invented a certain new and useful Improvement in Paper-Comminuting Machines, of which the following is a specification.

The present invention has for its object an improved machine for destroying documents, such as letters, checks and the like. Hitherto the destruction of such matter, unless effected by fire or by hand, or with the aid of apparatus working with liquids, has been carried out with grinding machines which grind most of the paper to a powder, or tear it into small pieces which are too short to enable paper of good quality to be manufactured again therefrom.

The object of the present invention is to provide a machine adapted to comminute waste manuscript and printed matter in such a manner that the particles are suitable for use in the manufacture of paper of good quality.

Three forms of construction of the improved machine are diagrammatically illustrated in the accompanying drawing, in which:—

Figures 1 and 2 are respectively a plan view and a side elevation of the cutting and tearing rolls used in one form of the machine, Fig. 3 being a side elevation of the machine, with part of the casing broken away. Fig. 4 is a front elevation of another form of construction, Fig. 5 being a side-view, and Fig. 6 a detail thereof. Figs. 7 to 10 illustrate the third form of construction, Fig. 7 being a side view of a pair of cutting rolls, Fig. 8 a front view of one of these rolls with the device for guiding the paper, Fig. 9 a side view of the entire series of rolls, and Fig. 10 a side view of the actuating gear.

The machine shown in Figs. 1 to 3, comprises a crank a which can be operated by hand or power and actuates two rolls b and c which rotate in opposite directions and between which the waste paper to be destroyed is passed. These rolls cut the paper into strips by means of flat rimmed sharp edged ribs d^1, d^2, d^3 , etc., the rolls being so set that the ribs on each of them enter the grooves between the ribs on the other. The ribs may be toothed or milled. The strips of paper are guided by combs e and f so that they pass between another pair of rolls

g, h arranged underneath and close to, the rolls b, c , the rolls g and h being driven by means of suitable toothed gear and having teeth extending throughout their width. The rolls g and h are driven at a higher speed than the upper rolls b, c , so that the strips of paper are torn into pieces. In order to mix up the pieces and prevent them from clinging together, a rotary beater i is arranged below the rolls g, h .

The construction shown in Figs. 4 to 6 comprises a shearing device o which first cuts the waste paper into strips. These strips drop between two cutting rolls b^1 and c^1 , the ribs of which mesh with each other and cut the strips transversely into small pieces equal in length to the width of the grooves between the ribs. The paper to be cut is fed to the shears from a table m by means of an intermittently acting feed device n , which pushes it forward step by step, each time the shears open, the shearing device being actuated by a crank p and connecting rod q . A bell crank r for actuating the feed device is struck at t by the ascending blade s of the shearing device o , so that the feed fingers n^1, n^2 , etc., move in the direction indicated by the arrow in Fig. 6, and push the paper along the table, the fingers being pulled back by springs m^1 when the blade s descends, and then sliding idly over the paper, by reason of their inclined position.

In the construction shown in Figs. 7 to 10, the cutting rolls b^2, c^2 work at opposite sides of two guide plates e^2, f^2 having apertures v for the milled cutting ribs d^{10}, d^{11}, d^{12} , as shown in Fig. 8. The plates afford guidance to the paper during its passage between the rolls, and prevent the paper from being pressed too deeply into the grooves between the ribs. The paper cut into strips by the rolls b^2, c^2 passes downward between two rolls g^2, h^2 (Fig. 9), which may consist of rubber with metal cores, and which rotate at the same speed as the cutting rolls. Beneath these rolls g^2, h^2 , but set somewhat aside, there is a pair of rubber rolls w, x rotating at a higher speed so that they tear the strips to pieces. Fig. 10 shows the driving gear for the three pairs of rolls. Three pairs of toothed wheels z^1, z^2, z^3, z^4 , and z^5, z^6 , are fixed to the respective rolls, and toothed wheels z^a and z^b transmit the drive from the first pair of rolls to the second, and from the second to

the third, the drive from the wheel z^b to the wheel z^c taking place through a pinion so that the rolls w and x are driven at a higher speed. The rubber rolls do not allow the paper to slip, and the lateral arrangement of the rolls w and x increases the adhesion of the paper, since it increases the frictional surface between the rolls and paper.

What I claim as my invention and desire to secure by Letters Patent of the United States is:—

1. A comminuting machine embodying a pair of coating cutting rolls for cutting the material operated on into strips, a pair of coating tearing rolls for dividing said strips into short lengths, and means for actuating both pairs of rolls at such relative speeds that the circumferential speed of the pair of tearing rolls exceeds that of the cutting rolls.

2. In a paper comminuting machine, the combination of a pair of paper slitting rolls and tearing rolls for receiving the slitted paper and operating at a greater peripheral speed than the slitting rolls whereby sufficient tension is placed upon the slitted paper to tear the same into short lengths.

3. A paper comminuting machine embodying in combination a pair of coating cutting rolls having a plurality of flat rimmed circular ribs extending circumferentially around the rolls in planes transversely of the axes of said rolls, said rolls being so positioned that the ribs of the two rolls mesh with one another, a pair of coating tearing rolls, means intermediate the cutting and tearing rolls whereby paper cut

into strips by said cutting rolls is fed to said tearing rolls, and means for actuating said cutting and tearing rolls so that the circumferential speed of the tearing rolls exceeds that of the cutting rolls.

4. A paper comminuting machine embodying a pair of coating cutting rolls having a plurality of flat rimmed circular ribs extending circumferentially around the rolls in planes transversely of the axes of said rolls, said rolls being so positioned that the ribs of the two rolls mesh with one another, two guide plates spaced apart and arranged between said cutting rolls, said plates having apertures for the ribs of said cutting rolls, a pair of coating tearing rolls, means intermediate the cutting and tearing rolls whereby paper cut into strips by said cutting rolls is fed to said tearing rolls, and means for actuating said cutting and tearing rolls so that the circumferential speed of the tearing rolls exceeds that of the cutting rolls.

5. In a paper comminuting machine, the combination of paper feeding mechanism, cutting rolls for cutting the paper into strips, rolls for dividing the cut strips into short lengths, said dividing rolls operating at a greater speed than the cutting rolls, and means for guiding the paper from the cutting rolls to the dividing rolls.

In witness whereof I have signed this specification in the presence of two witnesses.

FRITZ GÜETTLER.

Witnesses:

JEAN GRUND,
CARL GRUND.