

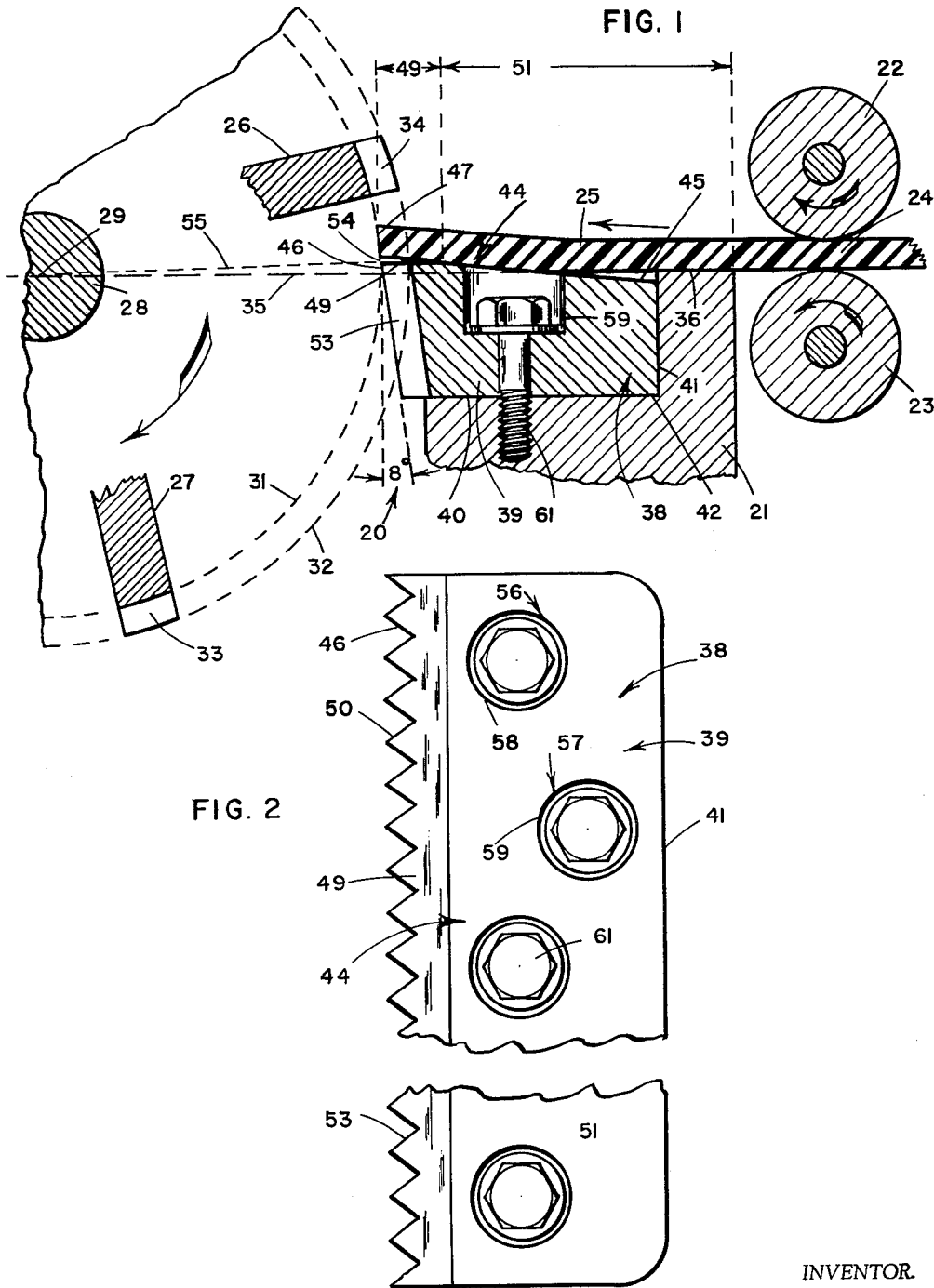
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ADJUSTABLE-INCLINED BED KNIFE

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ADJUSTABLE-INCLINED BED KNIFE

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This invention relates to an improved, detachable, stationary, toothed bed knife of the type used in pelletizing machines, or the like.

Such pelletizing machines usually include a set of toothed fly knives rotating on a fixed axis and a web supporting bed which feeds a web generally radially over the bed knife into the path of the fly knives.

The stationary toothed bed knife of such machines conventionally includes an upper face lying in a radial plane relative to the axis of rotation of the fly knives, the forward upper portion of the upper face requiring to be ground down occasionally to renew the forward upper, toothed cutting edge.

However, with each said grinding the forward upper cutting edge portion of the upper face is brought to a lower level below the radial plane and eventually the shelf, or recess, so formed fails to properly engage the teeth of the fly knives, the pellets are torn out of the advancing web rather than being severed therefrom and the web tends to flutter at the cut.

It is the principal object of this invention to provide a bed knife in which the advancing web is guided upwardly from a radial plane into the path of the fly knives so that the cutting edge is initially substantially above the radial plane. Thus the cutting edge portion of the upper face can be ground down for renewal many times before the cutting edge is lowered to the level of the radial plane and without causing flutter.

Another object of the invention is to provide a pelletizing, toothed, bed knife having an upper face which inclines upwardly and forwardly from the rearward edge to proximate the forward cutting edge, the forward portion of the upper face being horizontal and the mid width of the upper face being intersected by the plane of the web supporting bed of the machine. Flexible plastic webs, to be cut on the said bed knife, thus have their leading edges lifted to a level substantially above the normal radial cutting plane but the leading edges are directed substantially radially of the fly knives in the actual cutting zone.

Other objects and advantages of the invention will be apparent from the claims, the description of the drawing and from the drawing in which:

FIGURE 1 is a diagrammatic side elevation, in section, of the improved bed knife of the invention in position in a typical pelletizing machine, and

FIGURE 2 is a fragmentary plan view of the bed knife shown in FIGURE 1.

In the drawing a typical pelletizing machine 20 is illustrated diagrammatically, there being the conventional bed 21, driven rolls 22 and 23 forming a nip 24 for propelling a continuous web, or sheet, 25 of the material to be pelletized, the material usually being plastic. Fly knives 26 and 27 rotate in a cylindrical path, on a driven shaft 28, unidirectionally around the axis 29 of the shaft in the direction of the arrows. Concentric, circular dotted lines 31 and 32 illustrate the path of the toothed cutting edges 33 and 34 of the fly knives and a dotted line 35 illustrates the plane of the upper face 36 of bed 21, projected to the axis 29 in a plane radial to the path of the fly knives.

The upper face of conventional toothed bed knives, and the toothed cutting edges thereof, usually lie in the generally horizontal plane 35 with the web such as 25

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guided and supported along the plane. As mentioned above, it will be apparent that as soon as the cutting edges wear down, or are ground down, the effective cutting edge of the bed knife will be below the radial plane 35 and will drop increasingly therebelow due to wear and grinding.

The improved bed knife 38 of this invention comprises an elongated body 39 preferably having a flat, planar lower face 40 and a flat, planar, rearward face 41 normal thereto, adapted to be firmly seated in a suitable recess 42 at the forward extremity of the bed 21 in the conventional manner.

The web-supporting upper face 44 of the bed knife 38 inclines upwardly and forwardly from the rearward, upper edge 45 to the forward cutting edge portion 49, whereby the edge 45 is slightly below plane 35, for example .062 inch. The cutting edge 46 is at a predetermined spaced distance above plane 35, for example .062 inch and the plane 35 intersects the mid width of the upper face 44 of the bed knife. The edge 45 is thus depressed below the plane of the upper face 36 of bed 21 so that stock advancing thereover cannot strike the edge due to dimensional errors in the bed knife recess, or seat, 42. Preferably, in a bed knife of the proportions illustrated, the angle of inclination is about three and one half degrees, since a greater inclination would guide and support the leading edge 47 of the plastic web 25 to an undesirably high level and adversely affect the cut.

For example, in a bed knife approximately twenty-two inches long, two and one fourth inches wide and .812 inch thick at the rearward face, the forward face may be about .937 inch thick. The forward cutting edge portion 49 of the upper face 44 may thus be ground down for sharpening a distance of .062 inch before reaching the level of the plane 35.

Preferably the forward cutting edge portion 49 of the upper face 44 is initially parallel to the lower face 40 in a plane parallel to the plane 35 when the knife 38 is seated in recess 42. Grinding for sharpening is also in a plane parallel to plane 35 so that the portion 49, which may be of a width initially equal to twice the depth of the teeth 50, becomes increasingly wider with each grinding, but remains a minor portion of the width of the knife with the major portion 51, inclined as specified.

The toothed forward face 53 of the bed knife 38, is angularly disposed at an acute angle to the upper face 44, the faces 49 and 53 meeting at the sharp, toothed, cutting edge 46.

A web 25 which is self supporting will, thus not be in contact with the flat, horizontal forward portion 49 of the upper face 44, there being an angular space 54 therebetween. Such a space does not adversely affect cutting by the fly knives. Non self-supporting, limp webs will be supported on the portion 49, however, and it will be obvious that, if desired, the leading edge 47 of the web can be pressed downwardly flatwise against portion 49 by a suitable roll or other mechanical presser device. The cutting edge 46 of bed knife 38 is in a radial plane designated by the dotted line 55, the plane 55 being angularly in advance of the radial plane 35.

The body 39 of bed knife 38 includes at least one, and preferably two rows 56 and 57 of staggered countersunk bolt holes such as 58 and 59, each bolt hole extending from upper face 44 to lower face 40. The rows 56 and 57 are at a spaced distance in rear of the toothed forward face 46, in the major portion 51 of upper face 44 so that repeated grindings of the forward face portion 49 will not overlap, or reach the bolt holes. Suitable threaded bolts 61 are provided to detachably affix the bed knife 38 in its recess 42 in the bed 21 of machine 20.

In the particular embodiment shown, the width of the

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cutting edge portion 49 is about one quarter of an inch initially and the forward cutting face 46 is inclined away about eight degrees from a line tangential to the fly knife path at the cutting edge.

The improved bed knife 38 has been found to eliminate the flutter of the plastic web material which occurs with conventional bed knives reground with a recess in the conventional manner.

We claim:

1. In a pelletizing machine of the type having fly knives, each with a toothed cutting edge, rotating unidirectionally about an axis in a cylindrical path, a bed supporting a web of sheet material, to be pelletized, in a horizontal plane generally radial to said axis and propelling means feeding said web along said bed into the path of said fly knives the combination of:

a stationary bed knife, fixed at the extremity of said bed, said bed knife having a toothed forward cutting edge and forward face intermeshing at close clearance with the toothed cutting edges of said fly knives, and

a web-supporting, upper face on said bed knife, said face inclining upwardly and forwardly from the radial horizontal plane of said bed to a plane substantially spaced above said radial plane said forward cutting edge and guiding the leading edge of said web into the circular path of said fly knives at a radial plane angularly substantially in advance of the radial plane of said bed.

2. A bed knife as specified in claim 1 wherein: said web-supporting upper face inclines upwardly and forwardly at an angle of about three and one half degrees from the radial plane of said bed.

3. A bed knife as specified in claim 1 wherein: said web-supporting upper face inclines upwardly and forwardly, relative to the radial plane of said bed, from the rearward edge thereof for the major portion of the distance to the forward cutting edge thereof but the remaining minor portion of said face is in a plane parallel to the radial plane of said bed.

4. A bed knife for use in a rotary, fly-knife type, pelletizing machine having a web supporting bed in a generally horizontal plane, said bed knife comprising: an elongated knife body having a lower face adapted to be seated at the forward extremity of the bed

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of said machine, at a spaced distance from the path of the cutting edges of the fly knives thereof;

a web supporting upper face on said body inclining upwardly and forwardly from the rearward edge to proximate the forward cutting edge thereof, said face being intersected, in about mid width, by the plane of said bed, and

a toothed, forward face on said body angularly disposed at an acute angle to said upper face, said faces meeting at a sharp, toothed, forward cutting edge.

5. A bed knife as specified in claim 4 wherein: the forward portion of said inclined upper face, for a depth slightly greater than the depth of said teeth, is in a plane parallel to the plane of said lower face and parallel to the plane of said bed.

6. A bed knife as specified in claim 4 wherein: said body includes a longitudinally extending row of bolt holes, each extending from said upper face to said lower face, at a spaced distance in rear of said toothed forward face;

whereby the cutting edge portion of said inclined upper face may be ground down to sharpen said edges without overlapping said bolt holes.

7. A bed knife as specified in claim 1 wherein: said web supporting upper face is about two and one quarter inches in width and is inclined at an angle of about three and one half degrees relative to the plane of said bed

whereby the forward cutting edge of said knife is about .062 inches above, and the rearward edge of said knife is about .062 inches below, the level of the plane of said bed.

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