July 8, 1930. H. A. BALLARD 1,769,935

SPLITTING MACHINE

Filed Jan. 30, 1928 5 Sheets-Sheet 1

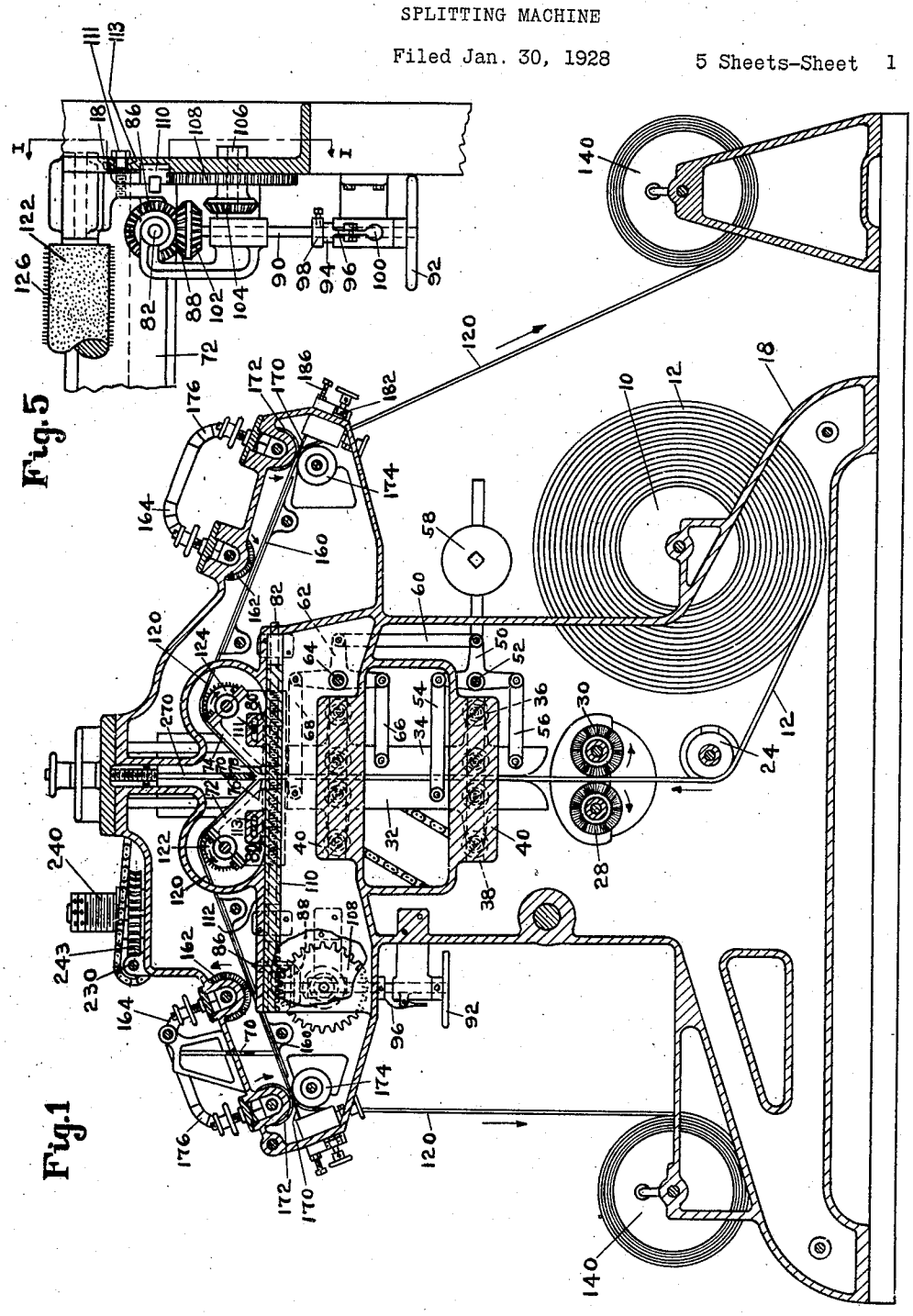


Fig. 5

Fig. 1

INVENTOR

Harrie A. Ballard

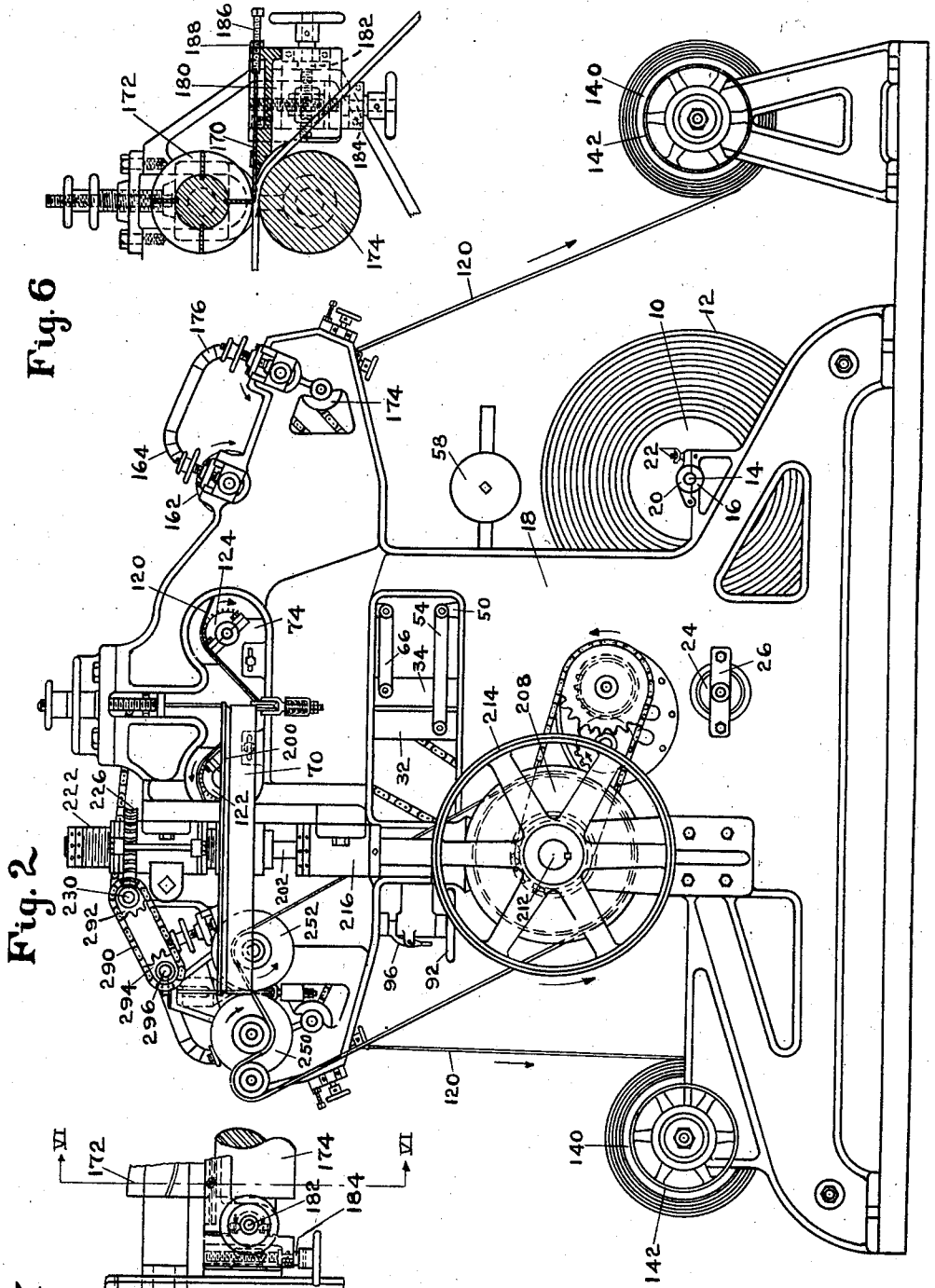
By his Attorney,

Nelson W. Howard

July 8, 1930. H. A. BALLARD 1,769,935

SPLITTING MACHINE

Filed Jan. 30, 1928 5 Sheets-Sheet 2




INVENTOR

Harrie A. Ballard

By his Attorney,

Nelson W. Howard

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SPLITTING MACHINE

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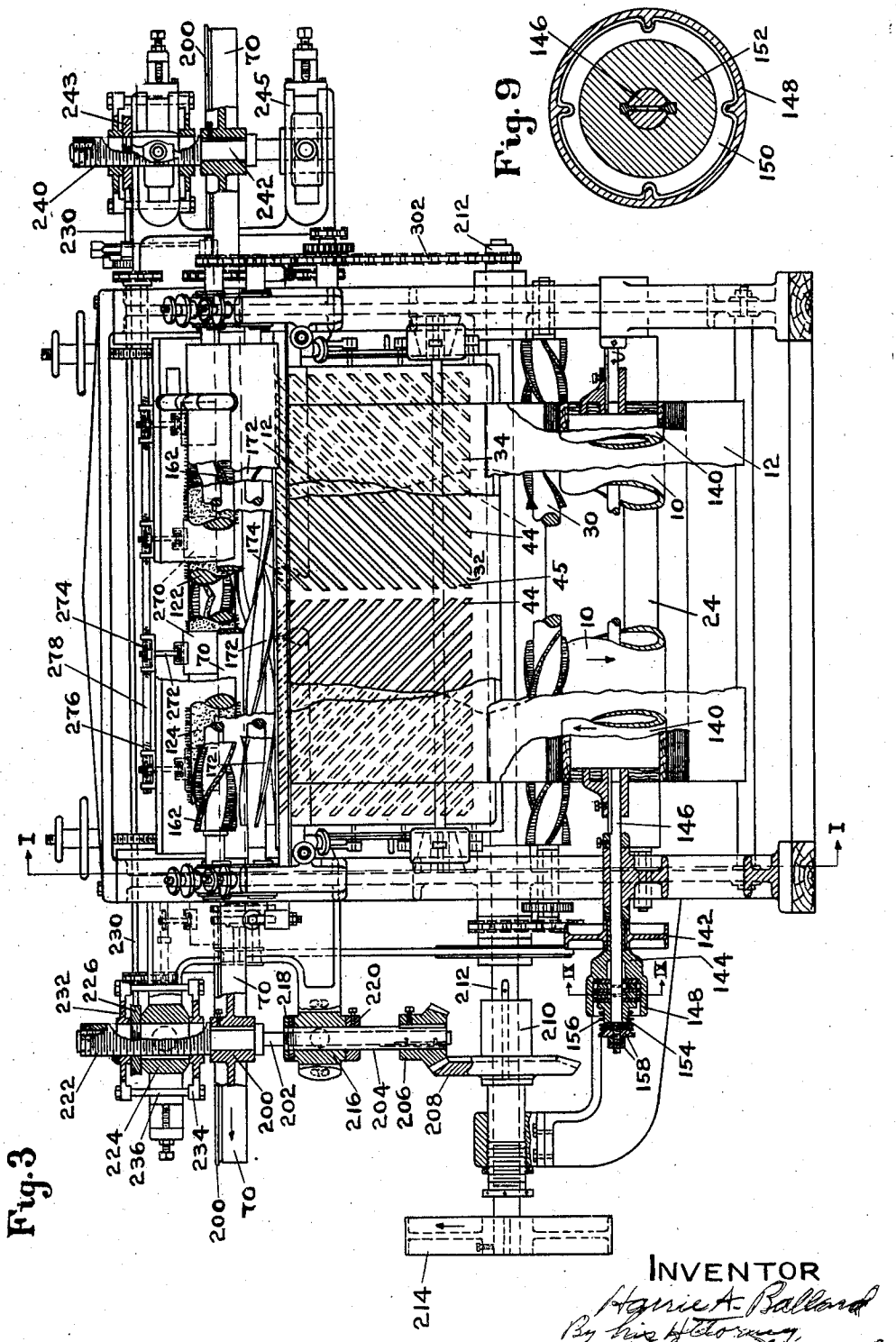



Fig. 3

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SPLITTING MACHINE

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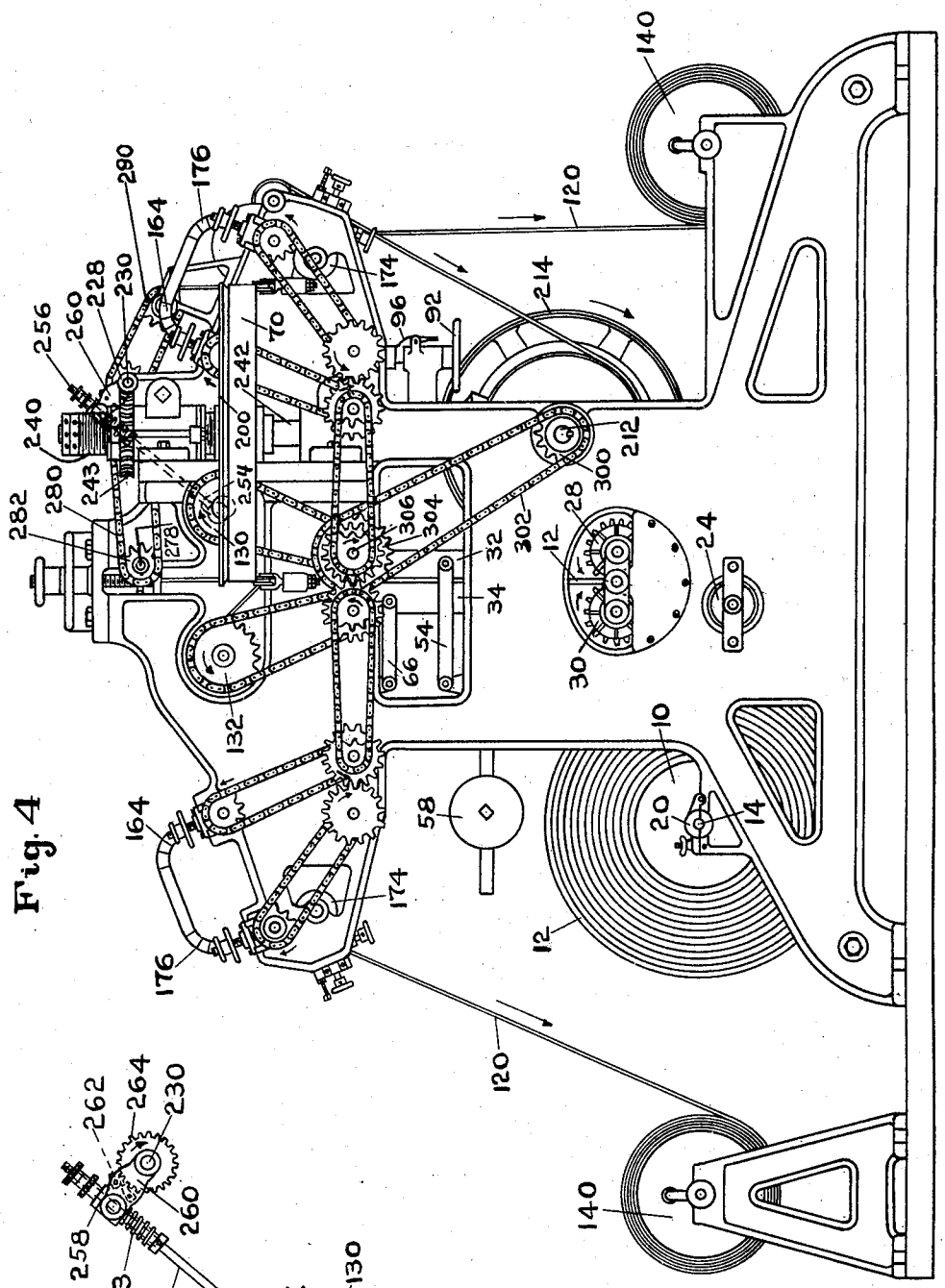



Fig. 4




Fig. 8

INVENTOR

Harrie A. Ballard

By his Attorney,

Nelson W. Howard

July 8, 1930. H. A. BALLARD 1,769,935

SPLITTING MACHINE

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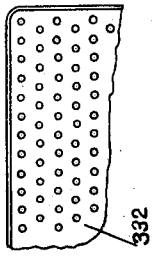



Fig. 11

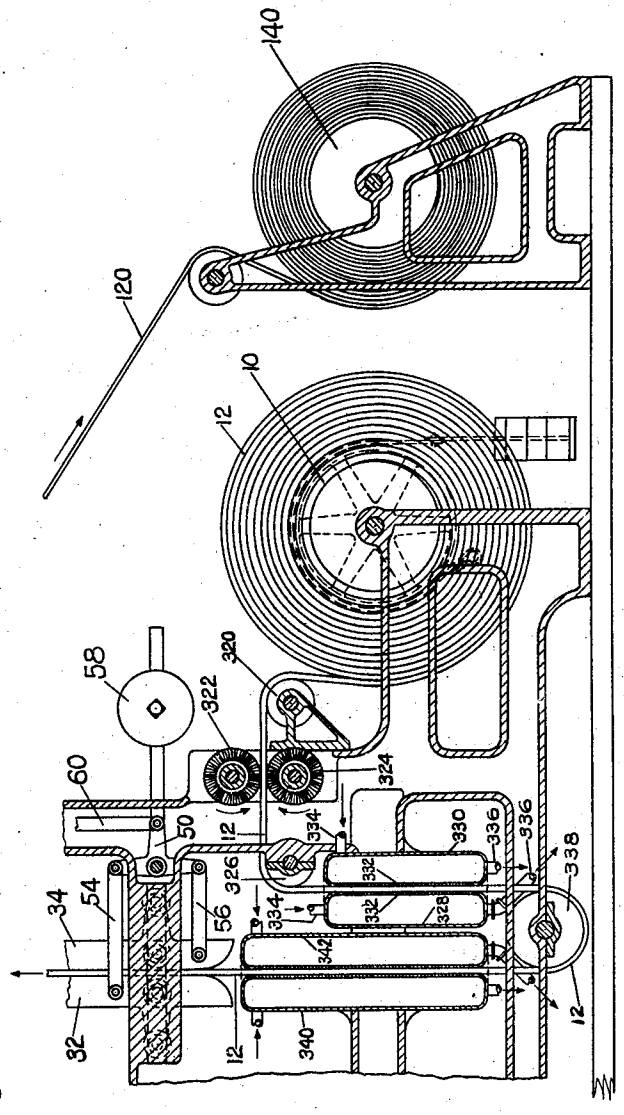



Fig. 10

INVENTOR

Harrie A. Ballard

By his Attorney,

Nelson M. Howard

Patented July 8, 1930 1,769,935

# UNITED STATES PATENT OFFICE

HARRIE A. BALLARD, OF BEVERLY, MASSACHUSETTS, ASSIGNOR TO THE TURNER TANNING MACHINERY COMPANY, OF PORTLAND, MAINE, A CORPORATION OF MAINE

## SPLITTING MACHINE

Application filed January 30, 1928. Serial No. 250,646.

This invention relates to splitting machines and is illustrated as embodied in a machine for splitting fabrics such as carpets.

Machines have heretofore been constructed for the purpose of splitting carpets or other fabrics woven double, that is, with two back or foundation pieces joined face to face by piling so that upon splitting the piling at a predetermined distance from one back piece, two carpets (for example), are produced each with a back piece or base fabric and a face of piling or nap of uniform depth. As constructed, these machines were provided with work engaging members which served the purpose of positioning the carpet or other fabric relatively to a cutter operative to sever the piling between the base fabrics of the double woven fabric. These work engaging members were also intended to place the fabric under a certain amount of tension so that the double woven fabric might be controlled in such a way as to permit satisfactory cutting of the piling between the base fabrics. Such prior constructions, however, have not proved satisfactory for the reason, no doubt, that in attempting to make the same pair of work engaging members serve both as work positioning and as work tensioning means neither function has been accomplished successfully under the varying conditions of actual factory operations. In this connection it is pointed out that work tensioning means must grip the work with considerable pressure in order to retard its movement and thus place it under tension, while work positioning means should not grip the work since that would means distortion of the fabric at a point near to the cutting edge of the cutter. It is not known that the described prior art constructions are now being used anywhere in the industry.

It is an object of this invention to provide an improved machine for the splitting of fabrics and other similar materials which are woven double and subsequently severed to provide two pieces of fabric. More particularly, it is an object of the invention to provide improved work positioning means and work tensioning means so organized that each may perform its function without any limitation imposed by the necessities of construction and mode of operation of the other.

To these ends, and in accordance with important features of the invention there is provided, means for tensioning the work before its presentation to a cutting instrumentality, said means being independent of means for positioning the work, so that the work may be properly controlled to the end that perfect cutting may be effected.

In the illustrated construction, the means for tensioning the fabric and for conditioning it effectively for cutting operations comprises a pair of bed plates for engaging with considerable pressure opposite sides of the material over substantial areas thereof to place the material under tension while it is being fed to a cutting instrumentality. Preferably and as shown, the bed plates serve also to spread the work laterally of its direction of feeding movement so that all portions thereof are maintained in extended condition suitable for the securing of uniform results in the cutting operations.

In addition to the tensioning means the illustrated machine is provided, as already indicated, with means for positioning the material in desired relation to the cutting instrumentality along the line of cutting operations, the said means comprising a pair of abutment members for engaging, without compressive effect and therefore without distortion of the work, opposite sides of the fabric closely adjacent to the cutting edge of the cutting instrumentality. Preferably and as shown, the abutment members are movable as a unit to position the fabric in predetermined relation with respect to the cutting edge of the cutting instrumentality, and movable with respect to each other properly to engage and back the material along the line of cutting operations. Conveniently, the movable abutment members carry work feeding rolls as the chief elements of work feeding means for engaging and feeding the split portions of the work, the construction and arrangement being such that the feeding rolls, in cooperation with the bed plates, maintain both the split and the unsplit portions of the work

under tension, with the split portions arranged at such an angle to each other as to insure tensioning of the material along the line of cutting operations.

A further important feature of the invention resides in improved adjusting means for maintaining the cutting instrumentality always at the proper cutting line in spite of the wearing away of said instrumentality due to the cutting of the fabric and to necessary grinding of the cutting instrumentality as by grinder mechanism with which the illustrated machine is provided for sharpening the cutter, the illustrated adjusting means comprising connections by which the feeding means for the fabric effect adjustment of the cutting instrumentality automatically as the machine continues in operation.

In the case of certain kinds of fabrics woven double as, for instance, carpets having two foundation pieces or base fabrics joined by piling woven into and between the base fabrics, it has been found that, from various causes, one or both of the base fabrics will become creased or corrugated. When this happens the two base fabrics are no longer uniformly spaced from each other. When it is attempted to produce two carpets by severing the piling of a double carpet at a predetermined distance from one base fabric, imperfect results are not infrequently obtained due to the fact that the cut piling over the corrugations or creases in the base fabrics is of a different length than that over the uncorrugated or uncreased portion. To remove such corrugations or creases, I moisten one or both base fabrics of the carpet before it reaches the cutter and preferably before any tensioning of the carpet takes place. To practice this method, means is provided for steaming the fabric before it reaches the cutter, the steaming means co-operating with feeding and tensioning means to effect effacement of the corrugations or creases so that both base fabrics may be uniformly spaced throughout. Now, if the double woven fabric be properly positioned with respect to the cutter through the operation of the movable abutment members as already described, two perfect carpets will result from the splitting operations.

These and other features of the invention and novel combinations of parts will now be described in detail and pointed out in the appended claims.

In the drawings,

Fig. 1 is a sectional view of a machine embodying the invention, taken along the line I—I of Fig. 3 looking in the direction of the arrows;

Fig. 2 is an end view of the machine looking from the left in Fig. 3;

Fig. 3 is a view in side elevation, and partly in section, looking at the machine from the right in Fig. 2;

Fig. 4 is a view in end elevation showing the opposite end of the machine from that shown in Fig. 2;

Fig. 5 is a detail of adjusting means for work positioning abutments with which the machine is provided;

Figs. 6 and 7 are detail views showing adjusting means for a stationary cutter or nap-evening mechanism;

Fig. 8 is a detail view of an operating connection which enables a feed roll mechanism to control adjustment of the cutter;

Fig. 9 is a detail view along the line IX—IX of Fig. 3 looking in the direction of the arrows;

Fig. 10 is a sectional view of the machine, similar to the view of Fig. 1 and showing an arrangement for steaming a carpet or other fabric before it is subjected to cutting operations; and

Fig. 11 is a detail view of a surface of a steaming chest.

In the illustrated splitting machine there is provided a cylindrical roller 10 mounted detachably in the frame of the machine and adapted to support a roll of carpet or other fabric to be cut, the fabric being indicated by the reference character 12. Upon reference to Figs. 2 and 4 of the drawings it will be observed that a shaft 14 for the roller 10 is provided with a two-part journal 16 for each of its ends and supported in frame 18 of the machine, the two-part journal comprising a clamp member 20 which is hinged to the frame 18 and is arranged to be secured in clamping relation to the shaft 14 by means of a bolt and winged nut 22. From the roller 10 the free end of the fabric 12 is led around an idler roll 24 (Fig. 1) supported at its ends by cross bars 26 (Fig. 2) detachably secured to the machine frame 18. From the idler roll 24 the sheet material is passed upwardly between two brushes 28, 30 which rotate in opposite directions and engage opposite sides of the sheet material to brush the same free of any adhering particles and to exert a preliminary tensioning and spreading action upon the material before it is acted upon by spreading and tensioning means now to be described.

The spreading and tensioning means just referred to comprises a pair of bed plates 32, 34 each of which is slidably mounted for movement toward and from the other. To provide for such sliding movement each bed plate has secured thereto a plurality of rollers 36 adapted to engage in guideways 38 in the form of grooves in frame members 40. Preferably, and as shown, each of the rollers 36 is the frustum of a cone with the large end of the frustum at the outside of each guideway 38, the purpose being to lessen vibration and secure a stable mounting for the bed

plates. As shown in Fig. 3 of the drawings each bed plate is provided with a plurality of spreader grooves 44 and ribs 45 extending outwardly in diverging directions upon each side of the median line of the bed plate. Since the spreader grooves and ribs engage opposite sides of the piece of fabric simultaneously while the latter is moving in an upwardly direction between the bed plates, the material is not only retarded by reason of friction and thus placed under tension, but is spread in extended condition in directions laterally of the feeding movement. Means is provided for keeping the bed plates yieldingly pressed toward each other, the said means, in the construction shown, being identical at each end of the machine and comprising a weighted bell crank lever 50 pivoted at 52 to the frame 18 of the machine and connected by a link 54 to the bed plate 32 and by another link 56 to the bed plate 34. At its outer end, or adjacent thereto, the bell crank 50 carries a weight 58 adjustable thereon to vary the pressure on the bed plates. Between the weight 58 and the pivot 52 the bell crank 50 has pivotally connected thereto a link 60 the upper end of which is pivotally connected to a bell crank lever 62 pivoted at 64 to the machine frame 18 and connected by a link 66 to the bed plate 34 and by another link 68 to the upper end of the bed plate 32. It will be readily understood that the bell crank levers 50 and 62 connected by the link 60 serve, through the described connections, to press the bed plates 32, 34 yieldingly toward each other and that the pressure may be varied as desired, by shifting the weight 58 along the extended arm of the bell crank lever 50.

Beyond the work tensioning and spreading means, described in the last paragraph, in the direction of movement of the work there is provided work positioning means for locating the work with respect to a cutter 70, the said means comprising, as shown, a pair of abutment members 72, 74 having work positioning abutment faces 76, 78. Preferably and as shown, the abutment members 72, 74 are adjustable with respect to each other and together with respect to the cutter 70. To accomplish these adjustments, each abutment member is provided with an interiorly threaded sleeve 80 with which there is engaged a screw threaded shaft 82, the screw on one side of the median line being left-handed and on the other right-handed so that upon rotation of the shaft 82 in one direction the abutment members 72, 74 will be caused to approach each other while upon rotation of the shaft in the opposite direction the abutment members will be caused to recede from each other. For rotating the shaft 82 the latter is provided with a bevel gear 86 (Figs. 1 and 5) arranged to mesh with a second bevel gear 88 secured to the upper end of a vertical shaft 90 when the latter is in the position shown in Fig. 5. For rotating the shaft 90 there is provided a hand wheel 92 secured to the lower end of the shaft in a position to be readily manipulated for adjustment of the shaft 82, adjustment of the shaft resulting, as already described, in the positioning of the abutment members 72, 74 with respect to each other. Upon removing a stop portion 94 of a latch member 96 from beneath a collar 98 on the vertical shaft 90 by proper manipulation of finger portion 100 of the latch member 96, the shaft 90 will drop downwardly to cause a bevel gear 102 carried fixedly thereby to mesh with a bevel gear 104 carried by a stub shaft 106 journaled in the frame of the machine. Carried by the same shaft 106 is a gear 108 arranged to mesh with the teeth of a rack bar 110 slidably mounted in guideways provided by the frame 18. Upon rotating the shaft 90 by means of the hand wheel 92 when the gear 102 is in mesh with the gear 104, the rack bar 110 is adjusted and by its adjustment it positions both abutment plates 72, 74 simultaenously since each is connected to a plate 112, both plates resting upon the rack bar in such manner as to be carried thereby. Each member 72, 74 is secured in adjusted position by a clamp screw 111 (Figs. 1 and 5) arranged to pass through a slot 113 in frame 18 to secure the member 72 or 74 after adjustment. It will be readily understood then, that the abutment members 72, 74 may be adjusted relatively to each other to accommodate pieces of work of different thicknesses, through adjustment of the shaft 82, and that both abutment members 72, 74 may be adjusted together so as to position the central vertical plane of the space between the abutment faces 76, 78 directly in line with the thin cutting edge of the cutter 70.

Means is provided for keeping the split portions 120 of the fabric 12 under tension so that these portions tension the fabric 12 along the line of operation of the cutting edge of the cutter 70 whereby the normally slack portions of the work are kept taut and in proper position for the cutting operation. In the construction shown for this purpose, there are provided feeding and tensioning rolls 122, 124, the cylindrical surface of each roll being provided with numerous pins 126 (Fig. 5) to engage with the fabric to pull it in a positive manner past the work tensioning and work positioning means already described. Conveniently, each roll 122, 124 is mounted in its corresponding abutment member 72 or 74 so as to partake of the adjustment of the latter and remain always in predetermined relation to its associated abutment member. Means is provided for rotating the pin rolls 122, 124 continuously in their respective directions of rotation as indicated by the arrows in Fig. 1, the said

means comprising sprocket wheels 130, 132 (Fig. 4).

For co-operation with the pin rolls 122, 124 in feeding the split portions 120 of the fabric away from the cutter 70 and for maintaining the split portions under proper tension, there are provided power driven winding rollers 140, one for each of the pin rolls 122, 124. As shown in the drawings, the split portions of the fabric are wound upon the rollers 140 through rotation of the rollers in the proper direction by power means comprising a pulley 142 (Figs. 2 and 3) arranged to be driven from any suitable source of power and at a higher speed than that of the pin rolls 122, 124. Upon reference to Figs. 3 and 9 of the drawings it will be observed that the pulley 142 is mounted fixedly upon a sleeve member 144 which is rotatable upon a shaft 146 which supports and drives the roller 140. As shown, the sleeve member 144 is provided with an enlarged portion 148 in which is positioned a plurality of clutch plates, certain of the plates indicated by reference character 150 being secured to the sleeve portion 148 to rotate therewith while other clutch plates indicated by reference character 152 are keyed to the shaft 146, the two sets of clutch plates being arranged alternately to engage with each other frictionally face to face under yielding pressure exerted by a presser member 154 which is engaged by a spring 156 held under tension by adjusting and lock nuts 158. It will be clear that the purpose of the friction clutch just described is to permit slipping of the pulley 142 on the shaft 146 while the pulley is being driven at a higher rate of speed than its associated pin wheel 122 or 124. In this way a constant tension on the split material is maintained during a nap evening operation (hereinafter described) and during winding of the fabric upon the roller 140.

After the split fabric leaves the pin roller 122 or 124 on each side of the cutter 70 it passes over a table 160 and is subjected to a brushing operation through the operation of a brush 162 journaled at its ends in the frame of the machine. At this point a pneumatic suction device is provided for removing particles of the nap or piling which have become broken or otherwise separated in the cutting action, the said pneumatic suction device being represented in the drawings by the pipe connection 164. Between the brush just mentioned and the winding roller 140 there is provided, in the construction shown, means for evening the napped surface of the fabric in case any of the piles have broken or been cut too long, the said means comprising a stationary blade 170 and a rotary bladed member 172 co-operating therewith to cut the nap fibres of excess length all to the same length as the whole body of piling. Preferably, and as shown, the fabric is supported opposite the knife 170 by a roller 174 and the direction of the fabric as it leaves this roller downward so that the knife 170 is located at a place where the nap will be standing up, due to the tension on the fabric and to the location of the knife at the bending point around the roller 174. It is at this point that the bladed roller 172 during rotation causes each blade thereof in turn to sweep along the edge of the stationary blade 170 to effect cutting of any nap fibres of excess length. Here, again the pneumatic suction device already spoken of is employed to carry off portions of the fibres, as indicated by the pipe connection 176. In order that the knife 170 may be readily adjusted to position it for efficient co-operation with the bladed cylinder 172 and in order that it may be adjusted to take care of wear it is mounted in a block member 180 provided with screw threaded members 182, 184 for adjustment of the block 180 in an upward direction and in a direction to carry the knife toward the bladed cylinder 172. Furthermore, the knife 170 is arranged to be backed by set screws, one of which is shown at 186, locked in position by a lock nut 188 which may be loosened to permit adjusting movement of the screw 186 and then again locked after adjustment has been made.

Preferably, and as shown, the cutter 70 is of the endless band knife type arranged to pass around two large wheels 200 one at each end of the machine. Upon referring to Fig. 3 of the drawings, it will be observed that the wheel 200 at the left end of the machine is provided with a driving shaft 202 the lower part of which is enclosed in a sleeve 204 keyed to the shaft to rotate therewith, the shaft 202 being vertically slidable within the sleeve. Secured to the lower end of the sleeve 204 is a bevel pinion 206 arranged in mesh with a bevel gear 208 secured to a sleeve 210 which surrounds and is keyed to one end of a shaft 212 which serves as the main shaft of the machine, the said shaft being provided with a pulley 214 adapted to be driven from any suitable source of power. At its upper end the sleeve 204 is journaled in a bearing 216 for rotation therein, being held from vertical movement by the nut 218 and the fixed collar 220. At its upper end the shaft 202 is secured to an exteriorly screw threaded member 222 which passes freely through a bearing 224 in the machine frame to be engaged by an interiorly screw threaded worm gear 226 with which there meshes a worm, similar to worm 228 (Fig. 4) at the other end of the machine, and fixedly secured to a rod 230 (Figs. 3 and 4) which extends across the machine from the first-mentioned worm to the other 228. For holding worm gear 226 against movement axially of sleeve 222 there are provided two annular members 232 and 234 clamped together on top and bottom

of bearing 224 by cross bars 236. A screw threaded sleeve 240 is fixed to another vertical shaft 242 which carries the other wheel 200 at the other end of the machine, and upon the sleeve 240 is a worm gear 243 which is operated through rod 230 to adjust shaft 242, wheel 200 and cutter 70 vertically in bearing 245. It will be clear that, if the rod 230 be rotated, both worm gears 226 and 243 will be operated to raise or to lower simultaneously the screw threaded members 222, 240. Such raising or lowering of the screw threaded members 222, 240 will result in raising or lowering of shafts 202, 242 and the wheels 200, and perforce, of the belt knife or cutter 70. While this operation may be accomplished manually, means is provided in the illustrated construction for accomplishing the adjustment of the belt knife 70 automatically so that as the knife is worn through grinding by grinding rolls 250, 252 (Fig. 2) it may be adjusted downwardly so as to maintain always the desired relation to the abutment surfaces at 76, 78 (Fig. 1) and to the fabric as it passes between and over said surfaces. For this purpose the ratchet wheel 130 for operating pin roll 122 is provided with an eccentric stud 254 (Figs. 4 and 8) to which is pivoted a pitman 256 which passes through a sleeve 258 pivotally carried by a lever 260 pivoted upon the rod 230, the lever 260 carrying a pair of pawls 262 for engagement with teeth of a ratchet wheel 264 fixed upon the shaft 230. As shown, the lever 260 is operated by the pitman 256 yieldingly through spring 263 on the pitman. As before stated, rotation of the rod 230 will cause movement in a vertical direction of both of the wheel carrying shafts 202, 242 with resultant adjustment of the wheels 200 and of the belt knife 70 carried thereby. It will be readily understood that the amount of downward movement of the belt knife for each rotation of the pin roll 122 is very small indeed, just sufficient to make proper allowance for the grinding and wearing away of the cutting edge of the band knife 70.

At the same time that the belt knife 70 is adjusted downwardly a plurality of backing plates 270 (Figs. 1 and 3) are also adjusted downwardly so as to afford a backing for the knife 70 along intermediate parts of the band knife between the wheels 200. Were it not for these backing plates 270 the band knife would yield upwardly and fail to perform its cutting function properly. Hence it is important that the plates 270 should be adjusted with the band knife 70. To accomplish this each plate 270 is provided with a stem 272 (Fig. 3) which carries at its upper end a worm gear 274 which is constantly in mesh with a worm 276 on a rod 278 which is arranged to be driven by a chain 280 (Fig. 4) extending from a sprocket wheel (not shown) on the shaft 230 to be driven by the said shaft, the other end of the chain 280 being arranged in engagement with a sprocket wheel 282 upon the shaft 278. Since the shaft 278 is driven at the same rate as the shaft 230, which causes lowering of the band knife 70, the backing plates 270 will also be adjusted downwardly at the same rate to keep in contact with the band knife 70. For a more detailed description of the means for adjusting the backing plates 270 reference may be had to United States Letters Patent No. 626,858 granted June 13, 1899, to A. A. Chilson.

Conveniently, also, the grinding wheels 250, 252 are adjusted with respect to each other as they wear away in grinding operations upon the band knife 70, this being accomplished by mechanism not herein disclosed since it is preferably of the type shown in the said Chilson patent. It is pointed out, however, that the adjusting means for the grinding wheels 250, 252 is controlled from the shaft 230 which causes adjustment of the band knife, the said controlling and operating means comprising a chain 290 (Fig. 2) arranged to engage with a sprocket 292 on the shaft 230 and with a sprocket 294 on a shaft 296 from which the adjusting means for the grinders 250, 252 is operated.

As shown in Figs. 2, 3, and 4, the shaft 212 at the end opposite to that which carries the pulley 214 is provided with a sprocket wheel 300 (Fig. 4) around which passes a chain 302 for engagement with a sprocket wheel 304 on a counter shaft 306 from which the shafts for the various feed rolls and brushes are driven through chain connections not necessary to describe, but clearly shown in Fig. 4 of the drawings.

In certain classes of double woven carpets it has been found that one of the base fabrics which are united by the piling of the carpet is commonly creased or corrugated with the result that the two base fabrics are not uniformly spaced from each other, being nearer together at the creases or corrugations. In attempting to split such a carpet in exactly equal parts to form two carpets, it is found that the cut piling over the corrugated or creased portions is shorter than it should be. This, of course, is objectionable and results in a product of greatly reduced quality. For removing the creases or corrugations from such carpets, applicant has provided a new way of treating the carpet which comprises the step of steaming the carpet, preferably after brushing the same, and before it is subjected to the splitting operation. For steaming the carpet there is provided a steaming arrangement of one or more steam chests. In order to utilize the space to the best advantage in the vertical type of splitting machine shown in the drawings, two vertically arranged steam chests are used and the carpet is passed first through one and then through

the other. Referring to Fig. 10 of the drawings, it will be observed that the carpet 12 on the roll 10 is passed first over an idler roll 320 and then between brushes 322, 324 corresponding exactly to brushes 28 and 30 of Fig. 1 of the drawings. From the brushes the carpet passes over a second idler roll 326 and then downwardly through a steaming means, consisting of two steam chests 328, 330 having each a perforated wall 332, as indicated in Fig. 10, and as more clearly shown in Fig. 11. Each chest is supplied by steam from a pipe 334 at the top of the chest, another pipe 336 at the bottom of the chest being utilized for carrying off the steam and any water that may collect through condensation within the chest. After leaving the first steam chests the carpet is passed over an idler roll at 338 and then up through between two steam chests 340, 342 similar to the chests 328, 330 and provided with the same arrangement of steam inlet and outlet pipes, the steam chests 340, 342 being arranged in vertical alinement with the bed plates 32, 34 so that the carpet passes from the steam chests vertically between the bed plates. From the bed plates it passes between the abutment members 72, 74 and finally to the cutter 70 in the manner and for the purpose described in the foregoing part of this specification.

In introducing a piece of fabric, such as a piece of carpet, into the machine, it is usual to make use of selvage portions provided for the purpose at one end of the fabric to engage with the fabric feeding means beyond the cutter. When the selvage ends have been passed between the plates 32, 34, also between the abutment members 72 and 74 and engaged with the power driven rollers 140, the machine is ready for operation. The various operations may be briefly recapitulated as follows: From the roll 10 the fabric passes over the idler roller 24 and then between the brushes 28 and 30 where all foreign bodies are removed from both surfaces of the fabric. If any foreign body were permitted to remain it might get to the abutment surface at 76 or 78 and by displacing the carpet fabric from smooth contact with said surface cause uneven cutting of the nap or pile. Continuing its upward journey the fabric passes between the bed plates 32, 34 which are provided with spreading blades 44 by which the fabric is spread out laterally in extended condition and at the same time kept under tension. After passing over the abutment surfaces at 76, 78 on the abutment members 72 and 74 respectively the fabric meets the cutter 70 which is usually positioned in the median line between the abutment surfaces so as to sever the fabric exactly in the middle. For maintaining the fabric under tension to keep it properly positioned against the abutment surfaces 76, 78 and to keep it suitably tensioned for the cutting operation there are provided the pin feeding rolls 122, 124 with which co-operate the power driven rollers 140 to keep the split portions of the fabric under proper tension and to assist in feeding the fabric to the knife or cutter 70 and away therefrom. As the fabric is severed it is wound upon the power driven rollers 140. The latter rollers are made removable so that they may be removed, when desired, to permit of the substitution of empty rollers when new pieces of work are introduced into the machine. Commonly, one end of a new piece of work is sewed to the rear end of a preceding piece of work before the said rear end has passed beyond reach into the machine. Thus the machine may continue to operate with little or no interruption on practically endless lengths of fabric.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a machine for operating upon carpets, a cutter, means for feeding the carpet to the cutter, means for tensioning the carpet to keep it in proper alinement with the cutter, and means for steaming the carpet so that the tensioning means may readily dispose the carpet in one plane with the backing fabric thereof at a uniform distance from the cutter as it passes the latter.

2. In a machine for splitting the piling between the base fabrics of a double woven carpet, a cutter, means for feeding the double woven carpet to the cutter, means for engaging with pressure a portion of the uncut carpet to tension the carpet, means constructed and arranged to engage the carpet without compressive effect and operative to position the carpet with respect to the cutter along the line of cutting operations, and means for adjusting the positioning means and securing it in adjusted position so that it will be non-compressive with respect to the carpet at or adjacent to the line of cut.

3. In a machine for splitting the piling between the base fabrics of a double woven carpet, a cutter, means for applying tension to the carpet before it reaches the cutter, means for pulling the carpet toward and against the cutting edge of the cutter, and means for moistening the carpet so that the pull on the carpet against the resistance of the tensioning means will serve to remove corrugations or folds in the carpet.

4. In a machine for splitting the piling between the base fabrics of a double woven carpet, a cutter, means for applying tension to the carpet before it reaches the cutter, means for pulling the fabric toward and against the cutting edge of the cutter, abutments independent of the tensioning means and located closely adjacent to the cutter, operative to engage the carpet without compressive effect to position the carpet so as to

predetermine the line of cut of the cutter with respect to the base fabrics of the carpet. and means for adjusting the abutments and securing them in adjusted position so that after adjustment they will be non-compressive with respect to the carpet at or adjacent to the line of cut.

5. In a machine for splitting the piling between the base fabrics of a double woven carpet, cutting means comprising a cutter, means for feeding the carpet to the cutter, a pair of bed plates for engaging opposite sides of the double carpet over considerable areas thereof to exert a retarding action on the carpet whereby the latter is placed under tension in resisting the pull of the feeding means, abutments located closely adjacent to the cutter for positioning the carpet with respect thereto, said abutments being adjustable with respect to each other and to the cutter, and means for securing the abutments in adjusted position so that they will not exert a compressive effect on the carpet at or adjacent to the line of cut.

6. In a machine for splitting the piling between the base fabrics of a double woven carpet, cutting means comprising a cutter, means on opposite sides of the cutter for feeding the carpet toward and against the cutting edge of the cutter, and positioning members for the carpet one on each side of the cutter and each having an abutment face located in predetermined relation to the cutting edge of the cutter, the feeding means and the positioning member on one side of the cutter being mounted for movement together in directions toward and from the cutter.

7. In a machine for splitting the piling between the base fabrics of a double woven carpet, feed rolls located at opposite sides of the cutter for engaging the split portions of the carpet to feed the latter to the cutter, positioning members located at opposite sides of the cutter for directing the carpet to the cutter in predetermined relation to the cutting edge of the latter, and means for mounting a feed roll and a positioning member together for movement as a unit toward or away from the cutter.

8. In a machine for splitting the piling between the base fabrics of a double woven carpet, cutting means comprising a cutter, a single feed roll on each side of the cutter for engaging with split portions of the carpet to pull the carpet toward and against the cutting edge of the cutter, means for engaging with the carpet before it is split operative in conjunction with the feed rolls to tension the carpet so that the piling thereof may be kept taut for the operation of the cutter, and a yieldingly actuated winding roller for each split portion of the carpet arranged to cooperate with the feed roll on the same side of the cutter to feed the split portion of the carpet and keep it under proper tension.

9. In a machine for splitting the piling between the base fabrics of a double woven carpet, cutting means comprising a cutter, means on each side of the cutter for feeding the carpet toward and against the cutting edge of the cutter, and positioning members for the carpet located on opposite sides of the cutter and each having an abutment face located in predetermined relation to the cutting edge of the cutter, said positioning members and feeding means being adjustable as a unit with respect to the cutter and also adjustable relatively to each other in sets on opposite sides of the cutter.

10. In a machine for splitting the piling between the base fabrics of a double woven carpet, cutting means comprising a cutter, means for applying tension to the carpet before it reaches the cutter, feed rolls on opposite sides of the cutter for feeding the work to the cutter, means for positioning the carpet comprising abutment members located closely adjacent to the cutter on opposite sides thereof so as to predetermine the line of cut with respect to the base fabrics of the carpet, and means for mounting the feed rolls and the abutment members in sets on opposite sides of the cutter so that a feed roll and an abutment member on one side of the cutter may be adjusted as a unit with respect to the other roll and abutment member.

11. In a machine for splitting the piling between the base fabrics of a double woven carpet, cutting means comprising an endless band cutter, wheels rotatable about vertical axes for supporting the operative run of the cutter in a vertical plane, means for feeding the carpet to the cutter by pulling in an upward direction upon the split ends of the carpet, a pair of abutment members below the cutter for engaging opposite sides of the double carpet to position the latter with respect to the cutter, the feeding means and the abutment members co-operating to spread the split ends of the carpet apart at an angle to accommodate the cutter and to place the piling of the carpet under tension for the cutting operation, said abutment members being adjustable relatively to each other and to the cutter, and means for securing said members in adjusted position spaced from each other so as not to exert compressive effect on the carpet at or adajcent to the line of cut.

12. In a machine for splitting the piling between the base fabrics of a double woven carpet, cutting means comprising an endless band cutter arranged to have its operative run in a vertical plane with its cutting edge pointing downwardly, feed rolls for engaging with split portions of the carpet to pull the carpet upwardly toward and against the cutting edge of the cutter, and ribbed pressure plates below the cutter for engaging the base fabrics of the carpet to spread the carpet in lateral directions and to resist move-

ment of the carpet by the feed rolls and thereby place it under tension.

13. In a machine for splitting the piling between the base fabrics of a double woven carpet, cutting means comprising a cutter, means for feeding the carpet toward and against the cutting edge of the cutter, pressure plates for engaging the base fabrics of the carpet to resist movement of the carpet by the feed rolls and thereby place it under tension, and means for steaming the carpet befort it reaches the cutter.

14. In a machine for splitting the piling between the base fabrics of a double woven carpet, cutting means comprising a cutter, means for feeding the carpet toward and against the cutting edge of the cutter, pressure plates for engaging the base fabrics of the carpet to resist movement of the carpet and thereby place it under tension, and steam chests for steaming the carpet before it reaches the pressure plates.

15. In a machine for splitting the piling between the base fabrics of a double woven carpet, means for cutting the piling between the base fabrics, means for tensioning the carpet and feeding it to the cutting means, means for steaming the carpet before it reaches the grip of the feeding and tensioning means, and means for evening the surface of the piling by clipping while it is still moist from the steaming operation.

16. That improvement in methods of splitting a fabric woven double with piling between two base fabrics which comprises, steaming one of the base fabrics and placing it under tension to efface any crease or corrugation in the steamed base fabric, and cutting the piling between the base fabrics while the fabrics are under tension.

17. That improvement in methods of splitting a fabric woven double with piling between two base fabrics which comprises, placing the body of the double woven fabric under tension, exerting a tension upon the piling longitudinally thereof, moistening the fabric, and severing the piling while it is under tension and while the body of the fabric is moist and under tension so as to secure a uniform length to the piling of each severed part of the double woven fabric.

18. That improvement in methods of splitting a fabric woven double with piling between two base fabrics which comprises, placing an intermediate portion of the body of a double woven fabric under pressure, pulling on an end portion of the double woven fabric to produce tension in the two base fabrics, moistening the fabric, placing the piling under tension in a direction longitudinally thereof, and cutting the piling while it is under tension at a predetermined distance from one of the base fabrics.

19. In a machine for splitting fabrics, cutting means comprising a belt knife, means for feeding the fabric to the knife, and means controlled by the feeding means for adjusting the belt knife toward the fabric so as to present the cutting edge of the knife always along the same line in spite of the wearing away of said cutting edge.

20. In a machine for splitting the piling between the base fabrics of a double woven carpet, cutting means comprising a belt knife, means located beyond the belt knife in the direction of movement of the carpet for feeding the carpet toward and against the cutting edge of the belt knife, and means controlled by the feeding means for adjusting the belt knife so as to maintain its cutting edge always in the same position relative to the carpet.

21. In a machine for splitting the piling between the base fabrics of a double woven carpet, cutting means comprising a belt knife, means for feeding the carpet comprising a roll having pins for engaging and moving the carpet toward and against the cutting edge of the knife, and connections between the pin roll and the belt knife for adjusting the latter to maintain its cutting edge always at the same level with respect to the carpet.

22. In a machine for splitting the piling between the base fabrics of a double woven carpet, cutting means comprising a belt knife, a pair of wheels for supporting and operating the knife and shafts for supporting the wheels, means for feeding the carpet toward and against the cutting edge of the knife comprising a roll having pins for engaging the carpet, and connections between the pin roll and one of the shafts of the knife supporting wheels for causing adjustment of both wheels to move the knife adjustingly so as to maintain its cutting edge always at the same level with respect to the carpet.

In testimony whereof I have signed my name to this specification.

HARRIE A. BALLARD.