

Lowery, G. R.

237151-237200

G-13

50287 0463

R. J. REYNOLDS TOBACCO COMPANY
RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject EVALUATION OF A ROTARY SELF CLEANING DRAW-OFF SCREEN IN A CONTINUOUS G-13 IMPREGNATOR

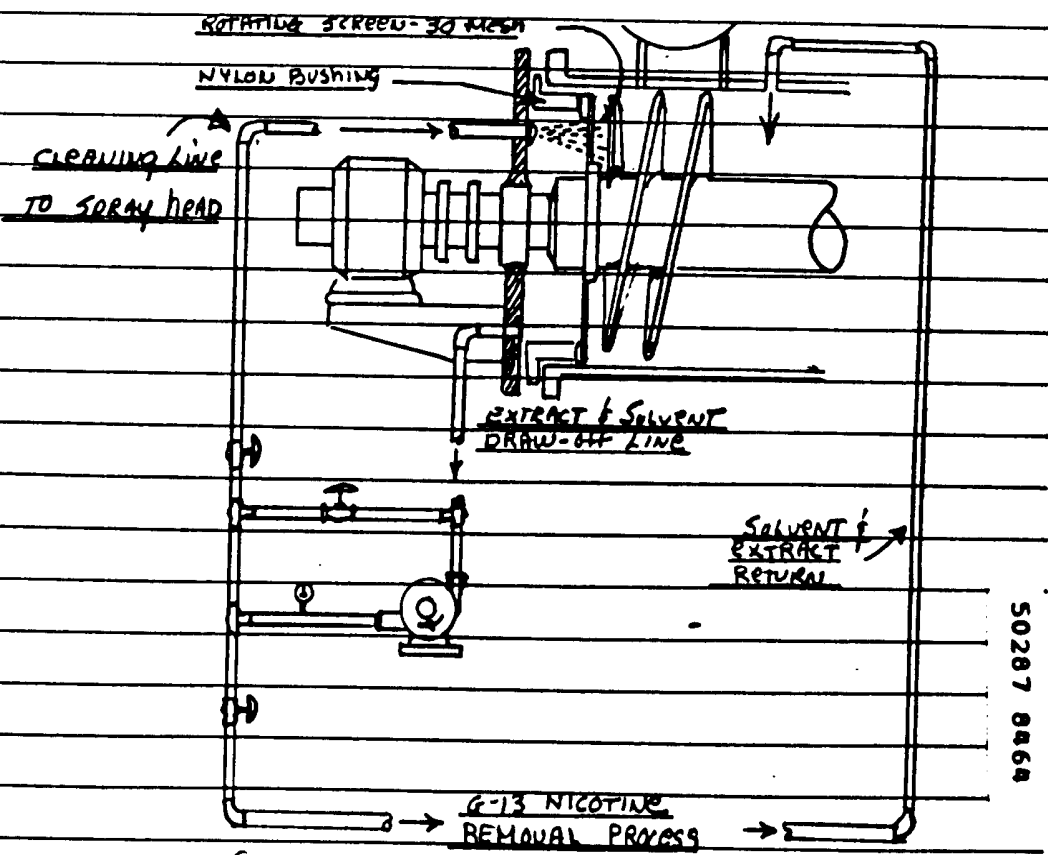
Job No. 2370

Date 2-26-71

237151

A ROTATING SCREEN WAS INSTALLED IN THE 24" COOKER IN 611-7 AND MADE READY FOR INITIAL TESTING ON OCT 20 1970. THE OBJECT OF THE SCREEN IS TO PROVIDE A MEANS OF DRAWING A PORTION OF THE IMPREGNATING POOL OUT OF THE COOKER FOR THE PURPOSE OF REMOVING NICOTINE FROM THE EXTRACT. PREVIOUS ATTEMPTS TO DENICOTINIZE TOBACCO IN CONJUNCTION WITH THE G-13 PROCESS RESULTED IN EITHER DRAWING OFF A CONSIDERABLE AMOUNT OF TOBACCO ALONG WITH THE EXTRACT & SOLVENT OR HAVING A FIXED SCREEN, OR FILTER, QUICKLY BLIND.

THE SKETCH BELOW ILLUSTRATES THE USE OF THE SELF CLEANING SCREEN WHEN USED IN CONJUNCTION WITH THE G-13N SYSTEM:



THE EQUIPMENT USED FOR THESE EXPERIMENTS WAS A 24" I.D. IMPREGNATOR CONTAINING A SCREW IMPELLER CONSISTING OF 20 FLIGHTS. SCREW SPEED CAN BE VARIED FROM 1/2 RPM TO 2 RPM

SIGNATURE AND DATE LR Perry 2-26-71

READ AND UNDERSTOOD [Signature]

R. J. REYNOLDS TOBACCO COMPANY
RESEARCH AND DEVELOPMENT DEPARTMENTS

Job No. 2370

Date 2-26-71

237152

Subject ROTARY DRAW-OFF SCREEN EVALUATION
(CONTINUED FROM PAGE 237151)

50287 8465

THESE SPEEDS PERMIT A RESIDENCE TIME IN THE FIRST COOKER OF 10' TO 40'. THE SECOND COOKER IS 18" I.D. AND CONTAINS A SIMILAR SCREW IMPELLER WITH SPEED ADJUSTMENT FROM 3/4 RPM (15' DWELL TIME) TO 2 RPM (40' DWELL TIME.)

THE PRINCIPLE OF OPERATION IS TO INSERT TOBACCO INTO THE 24" COOKER THROUGH AN AIR LOCK (ROTARY TYPE). THE COOKER CONTAINS A POOL OF HOT SOLVENT & PRESSURE GREATER THAN ATMOSPHERE. THE TOBACCO IS DROPPED FROM THE COOKER INTO A HOT VAPOR STREAM THROUGH A SECOND ROTARY AIR LOCK. (THIS PORTION IS COMMON TO THE REGULAR G-13 PROCESS) A PORTION OF THE SOLVENT POOL IS DRAWN OFF THROUGH THE ROTARY DRAW-OFF SCREEN & PASSED THROUGH A PUMP. DOWNSTREAM FROM THE PUMP A PORTION OF THE STREAM IS DIVERTED TO BACK WASH THE ROTARY SCREEN WHILE THE REMAINDER IS PROCESSED THROUGH A MILD ACID BATH FOR DENICOTINIZATION & RETURNED INTO THE COOKER.

INITIAL TRIALS RESULTED IN DAMAGE TO THE SCREEN CAUSING IT TO BE REMOVED FOR REPAIR. THE SCREEN WAS REINSTALLED & MADE READY FOR TRIAL ON 2-24-71.

NOT
USED

SIGNATURE AND DATE ER King 2-26-71

READ AND UNDERSTOOD [Signature]

R. J. REYNOLDS TOBACCO COMPANY
RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject EVALUATION OF A ROTARY, SELF-CLEANING
DRAW-OFF SCREEN IN A G-13 IMPREGNATOR

Job No. 2370Date 2-26-71

237153

2-26-71 - THE PURPOSE OF THIS TEST IS TO DETERMINE THE UPPER
FEED RATE LIMITS OF THE G-13N SYSTEM AT 611-7 AND TO
DETERMINE THE CONDITIONS NECESSARY TO PROCESS TOBACCO WITH
THE HIGHER FEED RATE. THIS TEST IS IDENTIFIED AS D-7.
CONDITIONS: 200# CF TOBACCO WAS PROCESSED IN THE G-13N
SYSTEM IN 611-7 AS FOLLOWS:

PRESSURE - 15# @ 19	H ₂ O DRAW-OFF RATE - 2 G.P.M.
TOBACCO FEED - 3# PER MIN	ACID TYPE - 1% MALIC
TIME - 1 st COOKER - 20 MIN	ACID DRAW-OFF RATE - 0.15 G.P.M.
TIME - 2 nd COOKER - 15 MIN	TOBACCO FEED MOISTURE - 21.0%
H ₂ O LEVEL - 1 st COOKER - 19"	COLUMN TEMP - 325°F
H ₂ O LEVEL - 2 nd COOKER - 0"	COLUMN DAMPER SET - 8

RESULTS NO CHOKES-UPS WERE EXPERIENCED DURING 1 HR FEED TIME,
FILLING CAPACITY - 880 @ 13% MOISTURE, NICOTINE IN H₂O EXTRACT
BEFORE ACID TREATMENT - 0.04%, NICOTINE IN H₂O EXTRACT AFTER
ACID TREATMENT - 0%

2-26-71 D-8 500# of CF TOBACCO WAS FED THROUGH THE G-13N
SYSTEM AT A FEED RATE OF 5# PER MIN. TO EVALUATE THE
EQUIPMENT & CONDITIONS AT A HIGHER FEED RATE.

CONDITIONS WERE:

PRESSURE - 20# @ 19	H ₂ O DRAW-OFF RATE - 3 G.P.M.
FEED RATE - 5# / MIN	ACID TYPE 1% MALIC
TIME - 1 st COOKER - 20 MIN	ACID FEED RATE 0.2 G.P.M.
TIME - 2 nd COOKER - 15 MIN	TOBACCO FEED MOISTURE 21.5%
H ₂ O LEVEL - 1 st COOKER - 19"	COLUMN TEMP 325°F
H ₂ O LEVEL - 2 nd COOKER - 0"	COLUMN DAMPER SET 8

RESULTS: NO CHOKES-UPS WERE EXPERIENCED DURING 100 MIN. FEED
TIME. H₂O EXTRACT INTO ACID BATH 0.04% NICOTINE, H₂O AFTER ACID
BATH 0.0% NICOTINE. NICOTINE IN FEED 2.26%, NICOTINE IN
PRODUCT - 1.93%, PERCENT NICOTINE REMOVED 14.6%.

NOT USED

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SIGNATURE AND DATE

E. R. Henry 2-26-71

READ AND UNDERSTOOD

R. J. REYNOLDS TOBACCO COMPANY
RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject EVALUATE THE EFFECTIVENESS OF THE ROTARY
DRAW-OFF SCREEN AT INCREASED FEED RATES

Job No. 2370

Date 3-2-71

237154

3-2-71 IN ORDER TO STUDY THE UPPER LIMITS OF THE G-13N
PROCESSING SYSTEM IN 611-7 AND THE CONDITIONS REQUIRED
TO G-13N PROCESS TOBACCO AT HIGHER FEED RATES, 500# OF
CF TOBACCO WAS FED THROUGH THE SYSTEM AT 7# PER MIN.
CONDITIONS:

PRESSURE - 20 psig	H-20 DRAW-OFF RATE	3 G.P.M.
FEED RATE - 7#/MIN.	ACID TYPE	1% MALIC
TIME 1 ST COOKER - 20 MIN	ACID FEED RATE	0.2 G.P.M.
TIME 2 ND COOKER 15 MIN	TOBACCO FEED MOISTURE	21.5%
H-20 LEVEL - 1 ST COOKER - 19"	COLUMN TEMP	325°F
H-20 LEVEL - 2 ND COOKER - 0"	COLUMN DAMPER SET	8

RESULT - AT THE START OF THE FEED A CHOK-UP OCCURED AT
THE HOPPER FOR THE INLET AIR LOCK, NO OTHER CHOK-UPS
WERE EXPERIENCED DURING THIS RUN. NICOTINE PERCENT IN
FEED TOBACCO 2.16%, NICOTINE PERCENT IN PRODUCT 1.93%,
PERCENT REMOVAL 10.7%

3-4-71 TO CONTINUE THE STUDY OF THE EFFECT OF HIGER FEED
RATES IN THE G-13N PROCESSING SYSTEM AT 611-7, 500# OF CF
TOBACCO WAS FED THROUGH THE PROCESSING SYSTEM AT A FEED
RATE OF 8# PER MIN. CONDITIONS WERE:

PRESSURE 20 psig	H-20 DRAW-OFF RATE	6 G.P.M.
FEED RATE 8#/MIN.	ACID TYPE	1% MALIC
TIME 1 ST COOKER 20 MIN	ACID FEED RATE	0.30 G.P.M.
TIME 2 ND COOKER 15 MIN	TOBACCO FEED MOISTURE -	21.6%
H-20 LEVEL - 1 ST COOKER 19"	COLUMN TEMP	325°F
H-20 LEVEL - 2 ND COOKER - 0"	COLUMN DAMPER SET	8

RESULT. A CHOK-UP OCCURED IN THE 18" COOKER AT THE
DISCHARGE TRANSITION TO THE AIR-LOCK, NO DATA WAS
OBTAINED FROM TOBACCO AT H-20 DURING THIS TEST.

X _____ NOT _____ X
X _____ USED _____ X

SIGNATURE AND DATE [Signature] 2-26-71 READ AND UNDERSTOOD [Signature]

50287 8467

R. J. REYNOLDS TOBACCO COMPANY
RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject EVALUATION OF THE ROTARY DRAW-OFF SCREEN
WITH INCREASED FEED RATES

Job No. 2370

Date 3-10-71

237155

3-10-71 TEST NR D-10 WAS REPEATED FEEDING 500# OF CF
TOBACCO THROUGH THE G-13N SYSTEM AT 611-7 AT A RATE OF
8# PER MIN. THE SCREW SPEED IN THE 18" COOKER WAS
REDUCED FROM 3/4 RPM TO 1/2 RPM TO REDUCE THE LOAD
ON THE OUTLET AIR LOCK AS THE SCREW FLIGHT PASSED
OVER THE TRANSITION. THE AIRLOCK SPEED WAS CHANGED
FROM ABOUT 5 RPM TO 2 1/2 RPM. OTHER CONDITIONS WERE
AS FOLLOWS:

PRODUCT	CF	H ₂ O DRAW-OFF RATE	3 G.P.M.
PRESSURE	35# sq. in. g.	ACID TYPE	1% MALIC
FEED RATE	8#/MIN	ACID FEED RATE	0.30 G.P.M.
TIME 1 ST COOKER	20 MIN	TOBACCO FEED MOISTURE	21.6%
TIME 2 ND COOKER	10 MIN	COLUMN TEMP	325°F
H ₂ O LEVEL - 1 ST COOKER	19"	COLUMN DAMPER SET	8
H ₂ O LEVEL - 2 ND COOKER	-0-		

RESULT - A CHOKE-UP OCCURED IN THE SEPARATOR DURING
THE START UP PERIOD, HOWEVER TOBACCO WAS FED AT 8#/MIN
FOR ABOUT 1 HOUR WITH NO FURTHER DIFFICULTY.

FAULTY CIRCUIT BREAKERS ON THE ACID PUMP CAUSED THE
NICOTINE REMOVAL DATA TO BE UNRELIABLE.

X _____ X

X _____ NOT _____ X

X _____ USED _____ X

X _____ X

X _____ X

X _____ X

X _____ NOT _____ X

X _____ USED _____ X

X _____ X

X _____ X

X _____ X

50287 8468

SIGNATURE AND DATE [Signature] 3-10-71 READ AND UNDERSTOOD [Signature]

R. J. REYNOLDS TOBACCO COMPANY
RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject A METHOD OF REDUCING THE RESIDUAL H₂O
IN G-13 PROCESSED TOBACCO

Job No. 2357

Date 12/16/71

237156

THE FOLLOWING EXPERIMENTS WERE CONDUCTED WITH THE MOHR TOBACCO CONDITIONER IN 611-4 TO DETERMINE THE EFFECT OF USING VACUUM and/or AIR CYCLED WITH STEAM AS A METHOD OF REDUCING THE H₂O CONTENT OF G-13 PROCESSED TOBACCO. THE EXPERIMENTS WERE CONDUCTED ON COMMON BLEND PROCESSED @ 601 ON 12/16/71

THE TREATMENT USED FOR THE FIRST CYCLE CONSISTED OF PLACING A G-13 FILLER CAN WITH APPROX. 150# OF G-13 PROCESSED TOBACCO IN THE MOHR UNIT. THE CHAMBER WAS SEALED & 30" OF VACUUM WAS DRAWN FOR 15'. THE VACUUM WAS BROKEN BY ADMITTING ROOM AIR (70° @ 65% RH). TOBACCO SAMPLES WERE TAKEN BEFORE & AFTER TREATMENT & SUBJECTED TO H₂O ANALYSIS
DATA ARE:

	H-20%	FILLING CAPACITY (ML/100GM)
BEFORE CYCLE	2.3	774
AFTER CYCLE	2.5	808

(VALUES ARE APPROX. DUE TO SMALL SAMPLE SIZE)

A SECOND FILLER CAN OF APPROX 150# OF G-13 WAS PLACED IN THE CHAMBER & 30" OF VACUUM DRAWN FOR 15'. STEAM WAS THEN INTRODUCED INTO THE CHAMBER (THRU THE PROBE INTO THE CHAMBER) UNTIL THE VACUUM WAS REDUCED TO 23'. STEAM WAS SHUT OFF & VACUUM RETURNED TO 30". (TOBACCO TEMP. @ END OF CYCLE WAS 96°F)

DATA ARE

	H-20%	FILLING CAPACITY (ML/100GM)
BEFORE CYCLE	2.5	666
AFTER CYCLE	0.11	530

NOT USED

SIGNATURE AND DATE *Charles...* 1/30/72

READ AND UNDERSTOOD J.W. Brown

50287 8469

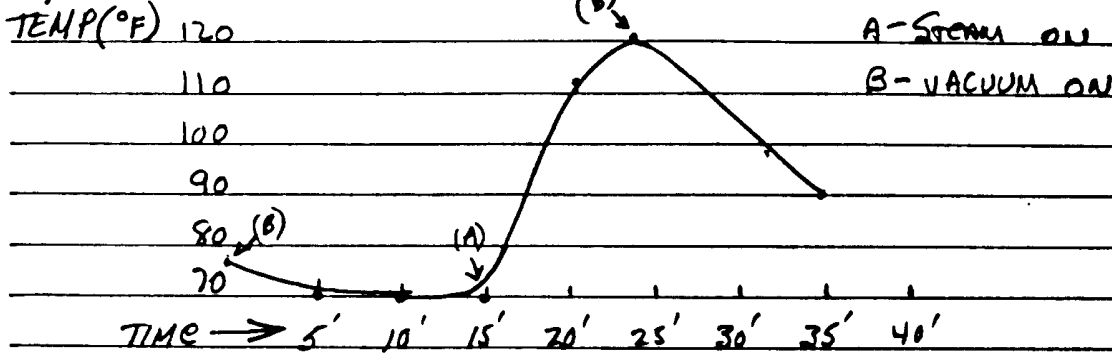
R. J. REYNOLDS TOBACCO COMPANY
RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject A METHOD FOR REDUCING THE AMOUNT OF RESIDUAL H₂O IN G-13 PROCESSED TOBACCO (CONT. FROM 237156)

Job No. 2357
Date 12/16/71
237157

A THIRD CYCLE WAS RUN BY PLACING A G-13 FILLER CAN WITH APPROX. 150# OF C-13 IN THE MONR UNIT & SEALED. A THERMOCOUPLE, ATTACHED TO A TEMPERATURE CHART RECORDER, WAS PLACED IN THE TOBACCO ABOUT 6" BELOW THE SURFACE IN THE CENTER OF THE CAN. A 30" VACUUM WAS DRAWN FOR 15' & STEAM WAS INSERTED INTO THE CHAMBER UNTIL THE TEMPERATURE OF THE TOBACCO HAD RISEN TO 120°F. STEAM WAS THEN CUT OFF & VACUUM AGAIN DRAWN UNTIL THE TEMPERATURE HAD DROPPED TO 90°F.

CYCLE PROFILE:



DATA ARE:	H-20%	FILLING CAPACITY	
BEFORE	AFTER	BEFORE	AFTER
1.3%	0.99%	794 ml/100 gm	722 ml/100 gm

(FIGURES ARE APPROXIMATE DUE TO SMALL SAMPLE SIZE)

THE FOLLOWING CYCLES WERE REPEATED ON THE MONR TOBACCO CONDOROWER @ G-1-4 USING APPROX. 150# BATCHES OF COMMON BLEND IN G-13 FILLER CANS. THE CYCLE CONSISTED OF: STEP (1) PLACE G-13 CAN IN THE MONR UNIT & SEAL (2) DRAW A VACUUM TO 30" (APPROX. 6 MIN.) (3) INSERT STEAM UNTIL THE TEMPERATURE OF THE TOBACCO HAS RISEN TO 120°F & HOLD FOR 6 MIN. (4) EVACUATE TO 30" OF VACUUM & HOLD UNTIL THE TEMPERATURE OF THE TOBACCO IS REDUCED TO 90°F.

DATA ARE:	BEFORE TREATMENT	AFTER TREATMENT	
FILLING CAPACITY	H-20%	FILLING CAPACITY	H-20%
813 ml/100 gm	1.12%	658 ml/100 gm	0.89%

||||| NOT USED |||||

SIGNATURE AND DATE Donald R. [Signature] 1/31/72 READ AND UNDERSTOOD J. W. [Signature]

50287 8470

R. J. REYNOLDS TOBACCO COMPANY
RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject REDUCTION OF RESIDUAL #20 IN G-13
PROCESSED TOBACCO
(CONTINUED FROM 237157)

Job No. 2357

Date 12/23/71

237158

TO EVALUATE A LONGER HOLDING TIME AT THE HIGH TEMPERATURE THE NEXT CYCLE CONSISTED OF (1) PLACE APPROX. 150# OF C-13 (IN A G-13 FILLER CAN) IN THE MOHR UNIT & SEAL THE CHAMBER (2) DRAW 30" VACUUM ON THE CHAMBER (3) ALLOW STEAM TO ENTER THE CHAMBER UNTIL THE TEMPERATURE OF THE TOBACCO RISES TO 120°F & HOLD FOR 9'. (4) EVALUATE THE CHAMBER UNTIL THE TEMPERATURE IS REDUCED TO 90°F.

DATA ARE:

	BEFORE TREATMENT	AFTER TREATMENT
FILLING CAPACITY	807 mL/100 gm	636 mL/100 gm
H-20%	1.07	0.19

TO STUDY THE EFFECT OF STEAM/VACUUM CYCLES ON BURLLEY, APPROX. 150# OF KF (IN A G-13 FILLER CAN) WAS PLACED IN THE MOHR UNIT & SEALED. (1) THE CHAMBER WAS THEN EVACUATED TO 30" FOR 15'. (2) VACUUM WAS THEN BROKEN WITH ROOM AIR (70°C @ 65% RH), RESULTS WERE THEN EVALUATED. DATA ARE:

	BEFORE TREATMENT	AFTER TREATMENT
FILLING CAPACITY	592 mL/100 gm	622 mL/100 gm
H-20%	0.34	0.40

50287 8471

APPROXIMATELY 150# OF KF (IN A G-13 FILLER CAN) WAS THEN PLACED IN THE MOHR UNIT & THE CHAMBER SEALED. (1) VACUUM WAS DRAWN TO 30" (2) STEAM WAS INJECTED INTO THE CHAMBER UNTIL THE TOBACCO TEMPERATURE REACHED 120°F & HELD FOR 6'. (3) VACUUM WAS THEN DRAWN UNTIL THE TOBACCO TEMPERATURE WAS REDUCED TO 90°F.

DATA ARE:

	BEFORE TREATMENT	AFTER TREATMENT
FILLING CAPACITY	597 mL/100 gm	497 mL/100 gm
H-20%	0.34%	0.12%

THIS TEST WAS REPEATED EXCEPT THE TEMPERATURE WAS HELD AT 130°F FOR 6' INSTEAD OF 120°F.

DATA ARE:

	BEFORE TREATMENT	AFTER TREATMENT
FILLING CAPACITY	626 mL/100 gm	481 mL/100 gm
H-20%	0.35	0.09

SIGNATURE AND DATE

J. W. Brown 1/30/72

READ AND UNDERSTOOD J. W. Brown

R. J. REYNOLDS TOBACCO COMPANY
RESEARCH AND DEVELOPMENT DEPARTMENTS

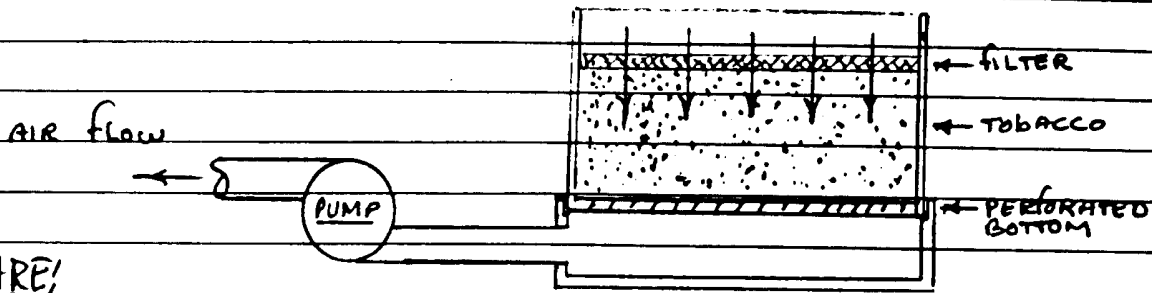
Job No. 2357

Date 1/11/72

237159

Subject TO EVALUATE A FLOW OF WARM MOIST AIR AS A MEANS OF REMOVING RESIDUAL H-2O FROM G-13 PROCESSED TOBACCO

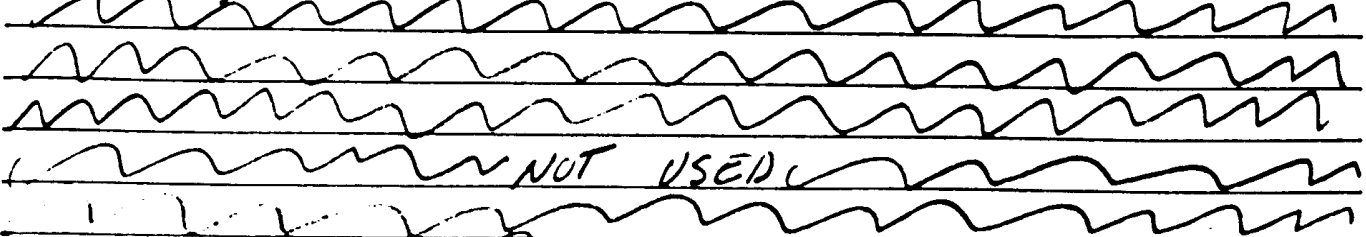
TO EVALUATE THE EFFECT OF A WARM MOIST FLOW OF AIR AS A MEANS OF H-2O REMOVAL FROM G-13 PROCESSED TOBACCO A BOX WAS CONSTRUCTED WITH A PERFORATED BOTTOM, TO HOLD APPROXIMATELY 100# OF G-13 PROCESSED TOBACCO. A PUMP WAS ATTACHED (AS PER THE SKETCH) TO INDUCE A FLOW OF AIR THRU THE TOBACCO.



DATA ARE:

DATE	TIME	TEMP.(°F)	RH%	CFM	H-2O (TEST) ^{TOBACCO} MOISTURE	H-2O (CONTROL) ^{TOBACCO} MOISTURE
1/11/72	1:15	70	65	109	0.94% @ 11.9	0.83 @ 11.8
1/11/72	4:00	72	65	109	0.69 @ 14.0	0.92 @ 12.0
1/12/72	8:50	70	66	107	0.17 @ 14.0	0.66 @ 11.8
1/12/72	3:45	72	66	107	0.14 @ 13.2	0.36 @ 11.8
1/13/72	3:30	70	66	107	0.08 @ 14.6	0.26 @ 11.8
1/14/72	2:00	70	65	107	0.04 @ 13.4	0.20 @ 12.0
1/17/72	2:00	70	65	107	0.03 @ 12.8	0.11 @ 12.3
1/18/72	2:00	70	65	107	0.02 @ 14.2	0.09 @ 12.1
1/19/72	11:00	70	65	107	0.02 @ 14.2	0.10 @ 12.0
1/21/72	11:00	70	65	107	0.02 @ 13.5	0.06 @ 11.8
1/27/72	11:00	69	64	107	0.01 @ 13.3	0.02 @ 11.8

NOTE: AS A CONTROL, A SIMILAR BOX WAS PLACED NEAR THE TEST BOX USING ONLY THE AIR FLOW THAT MAY HAVE BEEN INDUCED BY GRAVITY. TOBACCO WAS COMMON BLEND PROCESSED ON 1/11 ON 601 PROCESSING



NOT USED

SIGNATURE AND DATE Scott Roney 1/24/72

READ AND UNDERSTOOD J. W. Brown

50287 8472

R. J. REYNOLDS TOBACCO COMPANY
RESEARCH AND DEVELOPMENT DEPARTMENTS

Job No. 2357

Subject EVALUATION OF THE USE OF G-2 TO ASSIST IN THE
REMOVAL OF H₂O FROM G-13 PROCESSED

Date JAN 27 1972

237160

IN ORDER TO DETERMINE WHAT EFFECT THE APPLICATION OF G-2 WOULD
HAVE ON THE RATE OF ESCAPE OF H₂O FROM G-13 PROCESSED
TOBACCO APPROXIMATELY 100# OF C-13 WAS PLACED IN THE TEST
5 CONTROL BOXES DESCRIBED ON PP. 237159 & THE TEST REMAINED
EXCEPT THAT THE TOBACCO HAD 2.06% (BY WEIGHT) ALCOHOL
ON IT.

DATA ARE:

<u>DATE</u>	<u>TIME</u>	<u>TEMP(°F)</u>	<u>RH%</u>	<u>CFM</u>	<u>H₂O (TEST) MOISTURE</u>	<u>H₂O (CONTROL) MOISTURE</u>
<u>JAN 27</u>	<u>3:00</u>	<u>71°</u>	<u>65</u>	<u>110</u>	<u>0.36 @ 11.9%</u>	<u>0.41 @ 11.8%</u>
<u>1/28/72</u>	<u>2:00</u>	<u>71°</u>	<u>66</u>	<u>110</u>	<u>0.07 @ 13.2</u>	<u>0.20 @ 10.9%</u>
<u>2/1/72</u>	<u>9:30</u>	<u>69°</u>	<u>66%</u>	<u>110</u>	<u>0.04 @ 13.6</u>	<u>0.12 @ 11.7%</u>

TERMINATED 2/4/72 due to change in RH.

NOT USED

NOT USED

NOT USED

50287 8473

SIGNATURE AND DATE

Donald R. Brown 1/30/72

READ AND UNDERSTOOD

J.W. Brown

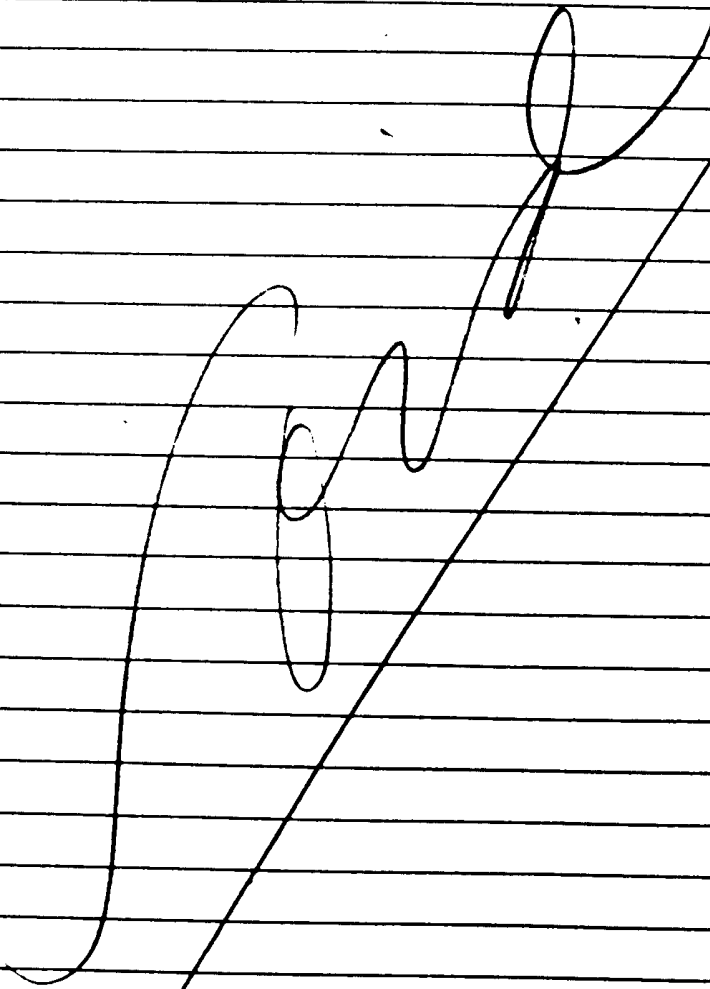
R. J. REYNOLDS TOBACCO COMPANY
RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237161

A large, stylized handwritten signature in black ink is written across the middle of the page, crossing over the horizontal lines. The signature is cursive and appears to be 'R. J. Reynolds'.

50287 8474

SIGNATURE AND DATE

READ AND UNDERSTOOD

R. J. REYNOLDS TOBACCO COMPANY
RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237162

SIGNATURE AND DATE

READ AND UNDERSTOOD

50287 8475

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237163

A large, handwritten signature in black ink is written across the lined paper. The signature is highly stylized and cursive, starting with a large loop on the left and ending with a large loop on the right. There are several additional scribbles and loops throughout the signature, particularly in the middle and lower right sections. A diagonal line is drawn across the page from the bottom left towards the top right, passing through the signature.

SIGNATURE AND DATE

READ AND UNDERSTOOD

50287 8476

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237164

Handwritten signature: *R. J. Reynolds*

SIGNATURE AND DATE

READ AND UNDERSTOOD

50287 8477

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Job No. _____

Date _____

Subject _____

237165

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50287 8478

R. J. REYNOLDS TOBACCO COMPANY
RESEARCH AND DEVELOPMENT DEPARTMENTS

Job No. _____

Date _____

Subject _____

237166

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50287 8479

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R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237167

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50287 8480

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237168

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SIGNATURE AND DATE

READ AND UNDERSTOOD

50267 8481

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237169

[Handwritten signature and scribbles across the lined area]

50287 8482

SIGNATURE AND DATE

READ AND UNDERSTOOD

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Job No. _____

Date _____

Subject _____

237170

A large, diagonal line is drawn across the entire lined section of the form. There are several handwritten scribbles: a large, irregular shape on the left side, a smaller, roughly oval shape in the middle, and another large, irregular shape on the right side. The lines of the form are visible through the scribbles.

SIGNATURE AND DATE

READ AND UNDERSTOOD

50287 8483

R. J. REYNOLDS TOBACCO COMPANY
RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237171

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SIGNATURE AND DATE

READ AND UNDERSTOOD

50267 8984

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237172

[Handwritten scribbles and a large diagonal line across the lined area]

SIGNATURE AND DATE

READ AND UNDERSTOOD

50287 8485

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237173

A large, diagonal line runs from the top right towards the bottom left, crossing the entire page. There are several large, loopy handwritten scribbles in black ink scattered across the lined area, including one in the upper left, one in the center, and one in the lower right.

50287 8486

SIGNATURE AND DATE

READ AND UNDERSTOOD

R. J. REYNOLDS TOBACCO COMPANY
RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237174

A large diagonal line is drawn across the lined area from the bottom left to the top right. There are several handwritten scribbles: a large loop on the left side, a smaller loop in the middle, a curved line below the middle loop, and a larger loop on the right side.

SIGNATURE AND DATE

READ AND UNDERSTOOD

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237175

A large, complex handwritten scribble in black ink covers the majority of the lined area of the form. The scribble consists of several overlapping loops and lines, making the text underneath completely illegible. It starts near the top left and extends towards the bottom right.

SIGNATURE AND DATE

READ AND UNDERSTOOD

50287 8488

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237176

[Handwritten scribbles and a large diagonal line across the page]

SIGNATURE AND DATE

READ AND UNDERSTOOD

50287 8489

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237177

[Handwritten scribbles and a large diagonal line across the lined area]

50267 8490

SIGNATURE AND DATE

READ AND UNDERSTOOD

R. J. REYNOLDS TOBACCO COMPANY
RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237178

[Handwritten signature and scribbles across the lined area]

SIGNATURE AND DATE

READ AND UNDERSTOOD

50287 8491

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237179

[Handwritten signature and scribbles across the lined area]

SIGNATURE AND DATE

READ AND UNDERSTOOD

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237180

A large, complex handwritten scribble in black ink covers the majority of the lined area of the form. The scribble consists of several overlapping loops and lines, including a large loop on the left side and a smaller loop in the center. A diagonal line runs from the top right towards the bottom left, intersecting the scribble.

SIGNATURE AND DATE

READ AND UNDERSTOOD

50287 8493

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237181

A large, diagonal line is drawn across the lined area of the form, extending from the top right towards the bottom left. Several large, loopy handwritten scribbles are present, including a large 'L' shape on the left side, a circular scribble in the center, and another large scribble on the right side.

SIGNATURE AND DATE

READ AND UNDERSTOOD

50287 8494

R. J. REYNOLDS TOBACCO COMPANY
RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237182

[Handwritten signature and scribbles across the lined area]

SIGNATURE AND DATE

READ AND UNDERSTOOD

50287 8495

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237183

[Handwritten scribbles and a large diagonal line across the lined area]

SIGNATURE AND DATE

READ AND UNDERSTOOD

50287 8496

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237184

SIGNATURE AND DATE

READ AND UNDERSTOOD

R. J. REYNOLDS TOBACCO COMPANY
RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

23/185

[Handwritten signature and scribbles across the lined area]

50287 8498

SIGNATURE AND DATE

READ AND UNDERSTOOD

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237186

[Handwritten scribbles and lines across the lined area]

50287 8499

SIGNATURE AND DATE

READ AND UNDERSTOOD

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237187

A large, handwritten signature, likely 'R. J. Reynolds', is written across the middle of the page. A diagonal line is drawn from the top right corner, passing through the signature, extending towards the bottom left corner of the page.

SIGNATURE AND DATE

READ AND UNDERSTOOD

50287 8500

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237188

[Handwritten signature and scribbles across the lined area]

SIGNATURE AND DATE

READ AND UNDERSTOOD

50287 8501

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237189

[Handwritten signature and scribbles across the lined area]

50287 8502

SIGNATURE AND DATE

READ AND UNDERSTOOD

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237190

[Handwritten signature: W. J. R.]

SIGNATURE AND DATE

READ AND UNDERSTOOD

50287 8503

Form 524

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237191

[Handwritten signature and scribbles across the lined area]

SIGNATURE AND DATE

Secure Business Forms, Inc., Winston-Salem, N. C. 27103

READ AND UNDERSTOOD

50287 8504

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237192

[Handwritten signature]

SIGNATURE AND DATE

READ AND UNDERSTOOD

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Job No. _____

Subject _____

Date _____

237193

[Handwritten signature: R. J. Reynolds]

50287 8506

SIGNATURE AND DATE

READ AND UNDERSTOOD

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237194

[Handwritten signature]

SIGNATURE AND DATE

READ AND UNDERSTOOD

50287 8507

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237195

[Handwritten scribbles and a large diagonal line across the page]

SIGNATURE AND DATE

READ AND UNDERSTOOD

R. J. REYNOLDS TOBACCO COMPANY
RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237196

[Handwritten signature and date: R. J. Reynolds]

SIGNATURE AND DATE

READ AND UNDERSTOOD

50287 8509

R. J. REYNOLDS TOBACCO COMPANY

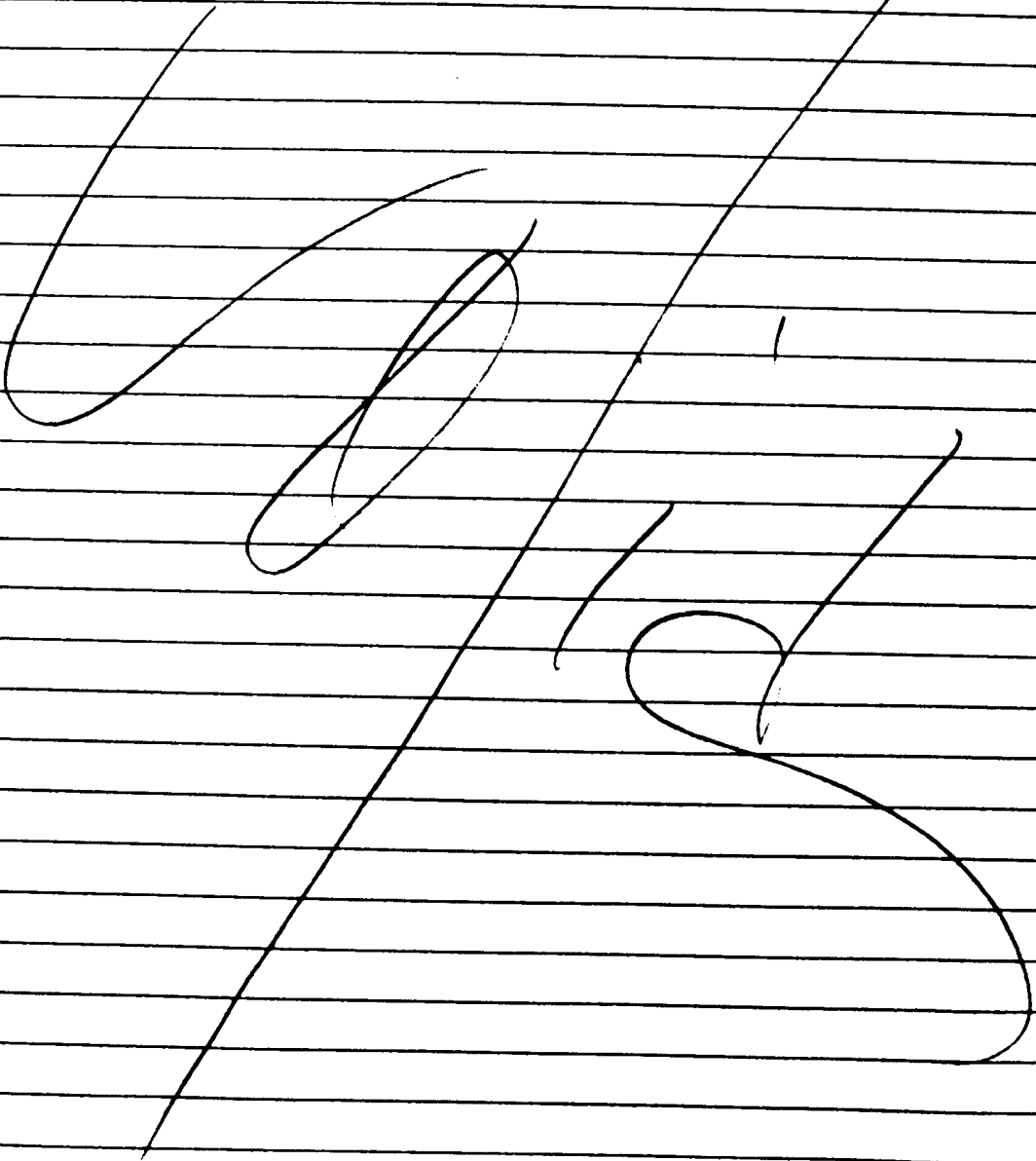
RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237197



50287 8510

SIGNATURE AND DATE

READ AND UNDERSTOOD

R. J. REYNOLDS TOBACCO COMPANY
RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237198

[Handwritten signature and scribbles across the lined area]

50287 8511

SIGNATURE AND DATE

READ AND UNDERSTOOD

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237199

[Handwritten signature and scribbles across the lined area]

SIGNATURE AND DATE

READ AND UNDERSTOOD

R. J. REYNOLDS TOBACCO COMPANY

RESEARCH AND DEVELOPMENT DEPARTMENTS

Subject _____

Job No. _____

Date _____

237200

[Handwritten signature]

SIGNATURE AND DATE

READ AND UNDERSTOOD

50287 8513

237201--237250 RJR FOODS

RJR

SECRET

No. 11 By _____

Frank, G. L.

237301-237350

Eastman Barrier Wrap

50287 8516