

**Application solutions for packaging technology:
Servo drive systems from SEW-EURODRIVE for
Flighted chains**



Flexible pouch packaging



Cartons with pouches for cake mix, packaged soups, or starch are neatly arranged on the shelves of supermarkets. Such pouches are efficiently placed into the cartons by so-called flighted chains. A flighted chain quickly and continuously collects the pouches and discharges the number of pouches required per carton. Such complex and dynamic processes are performed by packaging machines from OLI in Geretsried, Germany.

Application description

Two flighted chains are used to fill the cartons. One flighted chain collects the pouches arriving at high speed, the other chain releases the pouches into the carton. Both flighted chains perform the two tasks alternately. When a flighted chain is completely filled with pouches, it moves to the removal position where it discharges the collected pouches in parallel to the carton. Once the flighted chain has discharged all pouches, the now empty chain catches up the other chain as quickly as possible. In this way, one of the two flighted chains is always ready to collect pouches while the filled flighted chain is emptied by a rake and catches up the other flighted chain.

Criteria

- Erecting and glueing a carton
- Picking up the individual pouch
- Flexible handling of different package sizes
- Filling cartons
- Adaptation to different system geometries must be possible

Objective

Load is taken off the higher-level machine control as drive inverters control all sequences of motion such as synchronizing and positioning the flighted chain to the arriving pouches. The modulo positioning application allows for irrational gear ratios without the position drifting into one direction of rotation in endless operation. This means an inexpensive standard gear unit can be used. If the production process has to be stopped during running operation (emergency stop), operation can be resumed without the loss of products. Geometry data such as spacing, number of pouches and length of chain is specified depending on the system. The result is high flexibility in the packaging of different products.

Technological requirements

- Synchronous material transport
- Modulo positioning
- No product loss in the event of emergency stop
- Load is taken off the master PLC by transferring motion control to the drive inverter
- Handling of different package sizes



SEW-EURODRIVE right from the start – The intelligent and integrated products from SEW-EURODRIVE servo drive systems are convincing right from the project planning phase!

SEW-EURODRIVE solution

Two MOVIDRIVE® drive inverters, type MCS 41A 0022–5A3–4–0T, are used to control the two flighted chains that collect the pouches. The application involves precise synchronous operation, positioning and collision control of the two chains. The motion control function I-SYNC (internal synchronous operation) accomplishes optimal synchronization of the two flighted chains by using a virtual master encoder integrated in the drive inverter. Both chains exchange their positions via the fast system bus to avoid a collision. Recipe data and system geometries are communicated via the standardized fieldbus PROFIBUS, making the system compatible to the higher-level controller.

Success features

- Communication via standard fieldbus systems such as PROFIBUS, INTERBUS, DeviceNet or CANopen
- Highly dynamic drive: planetary gear unit PSE211DS56L
- MOVIDRIVE® MCS41A-0022 with integrated IPOS^{plus}® positioning and sequence control
- Integrated motion control function I-SYNC
- Virtual master encoder
- Collision control of the chains

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SEW-EURODRIVE is right there for you:

Argentina
Tel. 03327 457284
Fax 03327 457221
sewar@sew-eurodrive.com.ar

Australia
Tel. 03 99331000
Fax 03 99331003
enquires@sew-eurodrive.com.au

Austria
Tel. 01 6175500-0
Fax 01 6175500-30
sew@sew-eurodrive.at

Belgium
Tel. 010 231311
Fax 010 231336
info@caron-vector.be

Brazil
Tel. 011 64899133
Fax 011 64803328
sew@sew.com.br

Canada
Tel. 905 791-1553
Fax 905 791-2999
sew@sew.eurodrive.ca

Chile
Tel. 02 7577000
Fax 02 7577001
sewsales@entelchile.net

China
Tel. 022 25322612
Fax 022 25322611
sa@sew.com.cn

Colombia
Tel. 0571 5475050
Fax 0571 5475044
sewcol@andinet.com.

Czech Republic
Tel. 02 2012123436
Fax 02 20121237
sew@sew-eurodrive.cz

Denmark
Tel. 043 958500
Fax 043 958509
sew@sew-eurodrive.dk

Finland
Tel. 3 589300
Fax 3 7806211
sew@sew-eurodrive.fi

France
Tel. 0388736700
Fax 0388736600
sew@usocome.com

Great Britain
Tel. 1924893855
Fax 1924893702
info@sew-eurodrive.co.uk

Hong Kong
Tel. 2-796-0477
Fax 2-795-9129
sew@sewhk.com

Hungary
Tel. 01 4370658
Fax 01 4370650
office@sew-eurodrive.hu

India
Tel. 0265 2831021
Fax 0265 2831087
mdoffice@seweurodriveindia.com

Italy
Tel. 02-96980-1
Fax 02-96799781
sewit@sew-eurodrive.it

Japan
Tel. 05383 73811-13
Fax 05383 73814
sewjapan@sew-eurodrive.co.jp

Malaysia
Tel. 07 3545707
Fax 07 3541404
kchtan@pd.jaring.my

Mexico
Tel. 5 8882976
Fax 5 8882977
scmexico@seweurodrive.com.mx

Netherlands
Tel. 010 4463700
Fax 010 4155552
info@vector.nu

New Zealand
Tel. 09 2745627
Fax 09 2740165
sales@sew-eurodrive.co.nz

Norway
Tel. 69 241020
Fax 69 241040
sew@sew-eurodrive.no

Peru
Tel. 511 349-5280
Fax 511 349-3002
sewperu@sew-eurodrive.com.pe

Poland
Tel. 042 6771090
Fax 042 6771099
sew@sew-eurodrive.pl

Portugal
Tel. 0231 209670
Fax 0231 203685
infosew@sew-eurodrive.pt

Russia
Tel. 812 5350430
Fax 812 5352287
sew@sew-eurodrive.ru

Singapore
Tel. 68621701-705
Fax 8612827
sales@sew-eurodrive.com.sg

South Africa
Tel. 011 2487000
Fax 011 4942311
dross@sew.co.za

South Korea
Tel. 031 492-8051
Fax 031 492-8056
master@sew-korea.co.kr

Spain
Tel. 944318470
Fax 944318471
sew.spain@sew-eurodrive.es

Sweden
Tel. 036 344200
Fax 036 344280
info@sew-eurodrive.se

Switzerland
Tel. 061 4171717
Fax 061 4171700
info@imhof-sew.ch

Thailand
Tel. 038 454281
Fax 038 454288
sewthailand@sew-eurodrive.co.th

Turkey
Tel. 216 4419163
Fax 216 3055867
seweurodrive@superonline.com.tr

USA
Tel. 864 439-737
Fax 864 439-7830
cslyman@seweurodrive.com

Venezuela
Tel. 241 8329804
Fax 241 8386275
sewventas@cantv.net

**SEW
EURODRIVE**

SEW-EURODRIVE GmbH & Co KG
P.O.Box 30 23 · D-76642 Bruchsal/Germany
Phone +49 7251 75-0 · Fax +49 7251 75-1970
sew@sew-eurodrive.com

→ www.sew-eurodrive.com